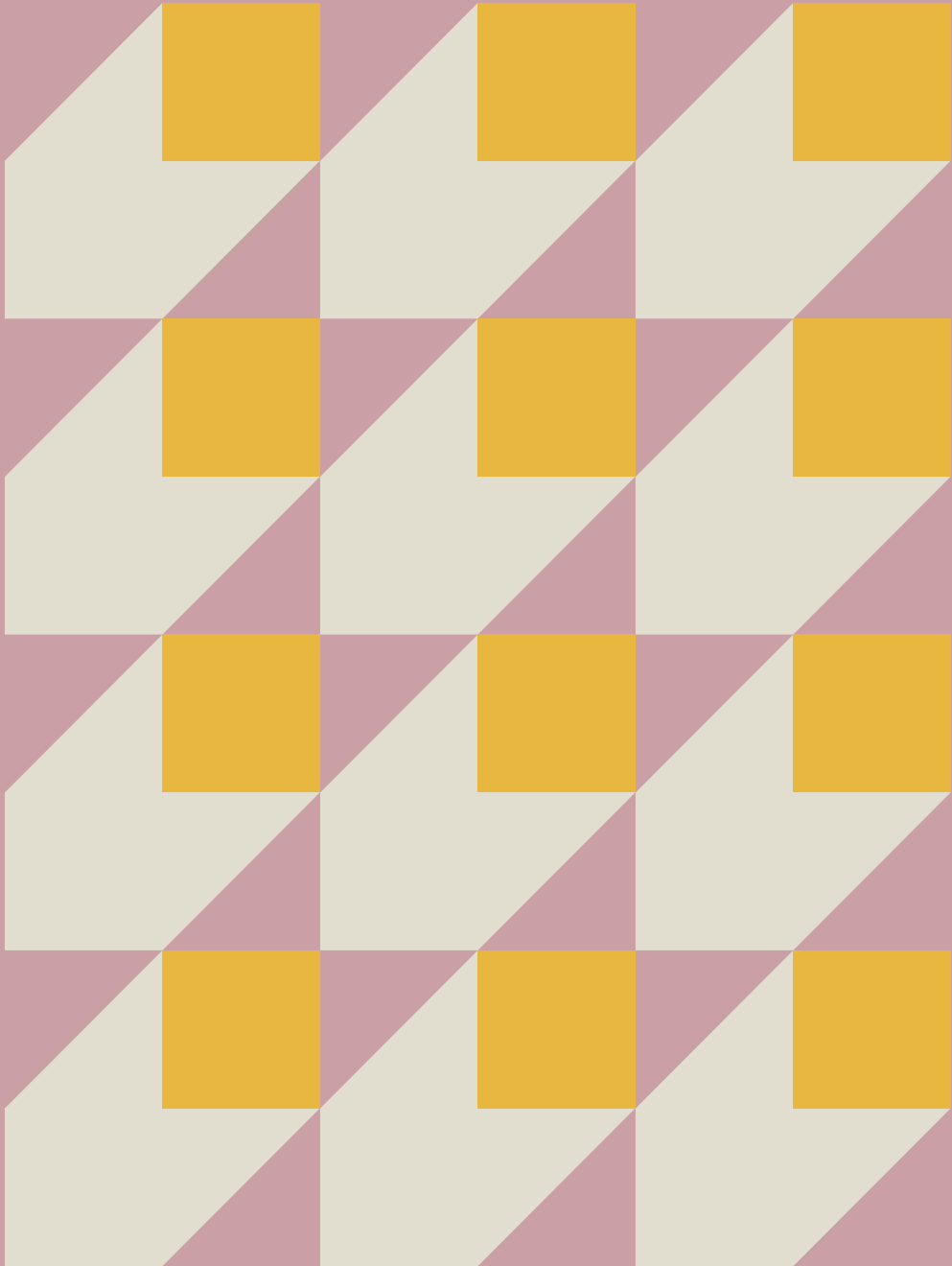


# From borders to interfaces

## Modularizing specialized outpatient services



**Katariina Silander**  
Helsinki, Finland 2019



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## Modularizing specialized outpatient services

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### **Academic Dissertation**

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# Original publications

This thesis is based on the following publications, which are referred to throughout the text by their Roman numerals.

- I SILANDER, K., TORKKI, P., LILLRANK, P., PELTOKORPI, A., BRAX, S.A., KAILA, M. *Modularizing specialized hospital services: constraining characteristics, enabling activities, and outcomes*. International Journal of Operations & Production Management, Vol. 37 Issue: 6, pp.791-818, 2017.
- II SILANDER, K., TORKKI, P., PELTOKORPI, A., LEPÄNTALO, A., TARKKANEN, M., BONO, P., KLINTRUP, K. AND KAILA, M. *Modularising outpatient care delivery: a mixed methods case study at a Finnish university hospital*. Health Services Management Research, Vol. 31 Issue: 16, pp. 195-204, 2018.
- III SILANDER, K., TORKKI, P., PELTOKORPI, A., TARKKANEN, M., LEPÄNTALO, A., MATTSON, J., BONO, P., KAILA, M. *“Comparing modular and personal service delivery in specialized outpatient care: survey of hematology and oncology patient preferences”*. Accepted for publication in Health Services Management Research 7/2019.

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# Abbreviations

<b>CI</b> .....	95% Confidence Interval
<b>FTE</b> .....	Full Time Equivalent
<b>DSO</b> .....	modes: demand and supply- based operating modes
<b>HUS</b> .....	Helsinki University Hospital
<b>IHIP</b> .....	intangibility, heterogeneity, inseparability, and perishability (of services)
<b>OECD</b> .....	Organisation for Economic Co-operation and Development
<b>OR</b> .....	Odds Ratio
<b>OULU</b> .....	Oulu University Hospital
<b>P1</b> .....	Proposition 1
<b>P2</b> .....	Proposition 2
<b>P3</b> .....	Proposition 3
<b>P4</b> .....	Proposition 4
<b>P5</b> .....	Proposition 5
<b>SDL</b> .....	Service Dominant Logic



## Background and aims

In healthcare, both the need to increase patient-centered care and customization, and simultaneously reduce costs has been recognized. Mass customization and its key means, modularization, are operations management models that are suggested to have potential to tackle this conundrum by enabling simultaneous standardization and customization of services. However, more knowledge of the applicability of modularization and mass customization is needed. This thesis focuses on modularization of hospital healthcare delivery. It aims to identify enablers, constraints, and outcomes related to the modularization of healthcare services focusing on specialized healthcare from the perspective of hematology care, and to identify patient preferences related to day hospital service delivery and number of treating nurses in a hematology and oncology care context.

## Data and methods

Both mixed methods and data were used in the study. Data were gathered from the Helsinki University Hospital's (HUS) Comprehensive Cancer Center, Meilahti Triangle Hospital's day hospital, and hospital-wide databases. Quantitative data including service usage, bed count, and personnel resource information from the hematology unit and Meilahti Triangle Hospital were obtained between 2009–2010 and 2013–2014. Semi-structured interviews (n=16) of personnel members of the oncology and hematology units and the Meilahti Triangle Hospital's day hospital were conducted. In addition, unstructured interviews of key hematology personnel members were conducted. A questionnaire survey to oncology and hematology patients was carried out. Field visits were organized. In addition, treatment instructions from both the hematology and oncology unit and scheduling instructions of the independent day hospital (Meilahti Triangle Hospital's day hospital) were analyzed. Reference data on changes in hematology care were obtained from Oulu University Hospital (Oulu).

## Results

Six enablers and two constraints affecting the modularization of hospital care were

# Abstract

identified. The findings indicate that healthcare characteristics such as the requirement to treat all, information asymmetry, professional autonomy, hierarchy, and fragmented service delivery may challenge modularization. However, by applying design activities that support modularization, these challenges may be overcome. Modularization may have both positive and challenging outcomes to healthcare service delivery. The findings indicate that modularization may be an applicable method to support the change from inpatient- to outpatient-focused care in a hospital context. In addition, modularization may streamline service production and communication, and increase replaceability among personnel. However, modularization may not increase customization or patient involvement in care delivery design and might restrict communication.

Both patient groups, oncology patients treated in a traditional specialty-specific day hospital with named nurses, and hematology patients treated in a multispecialty modularized day hospital without named nurses, were satisfied with their day hospital care. Oncology patients preferred named nurses and a maximum of three treating nurses in day hospital care more often than hematology patients. In addition, the number of treating day hospital nurses and annual visits affected preferences.

### **Conclusions**

The findings indicate that modularization may be an applicable method to support the change from inpatient- to outpatient-focused care in a hospital context. However, organizations need to balance the requirement of customization versus standardization in order to increase the success and applicability of the operating model. This is important as modularization may not increase customization or patient involve-

ment in care delivery design and might restrict communication. The findings indicate that when applied to the care of right patient groups, patients may be satisfied with modularized care. However, this study indicates that not all patient groups may be in favor of modularization, especially if it means that patients would not have a named nurse in outpatient care. In addition, healthcare characteristics should be taken into account, as they may constrain modularization and affect the outcomes of modularized services. As not all outcomes are merely positive, organizations should carefully consider in which situations modularization could enhance service production. Altogether, more research is needed to understand when and in what situations modularization is applicable and most likely successful in developing healthcare service delivery. 🧠







Väitöskirjan tavoitteena oli tunnistaa erikoissairaanhoidon modularisointiin liittyviä mahdollistajia, rajoitteita sekä seurauksia. Lisäksi tavoitteena oli tunnistaa ja selvittää potilaiden näkemyksiä liittyen modularisoitujen päiväsaaralatoimintojen tuottamiseen ja hoitavien hoitajien määrään päiväsaaralassa.

Tutkimuksessa käytettiin sekä laadullisia että määrällisiä menetelmiä. Tutkimuksen aineisto kerättiin Helsingin yliopistolaisen keskussairaalan (HUS) Syöpäkeskuksesta, Meilahden kolmiosairaalan päiväsaaralasta ja HUS:n yleisistä tietojärjestelmistä. Kvantitatiivinen aineisto kerättiin HUS:n Syöpäkeskuksen hematologian yksiköstä ja Meilahden kolmiosairaalan päiväsaaralasta ajalta 2009–2010 ja 2013–2014 ja aineisto sisälsi seuraavia tietoja: käyntitiedot, sänkyjen määrä ja henkilöstön määrä. Tutkimuksessa haastateltiin 16 henkilöstön jäsentä Syöpäkeskuksesta (onkologia ja hematologia) tai Kolmiosairaalan päiväsaaralasta; lisäksi toteutettiin tutkimusta tukevia yksilöhaastatteluita. Onkologian ja hematologian potilaiden näkemyksiä ja kokemuksia liittyen päiväsaaralatoimintaan selvitettiin kyselyn avulla. Kyselyä varten suoritettiin viisi esihaastattelua potilaille. Lisäksi tutkimuksessa käytettiin apuna hoito- ja aikataulutushojeita sekä toteutettiin kenttävierailut yksiköihin. Syöpäkeskuksen hematologian potilaita hoidetaan Kolmiosairaalan päiväsaaralassa, joka on modularisoitu ja jossa ei ole omahoitajia. Onkologian potilaita hoidetaan Syöpäkeskuksen Syöpäklinikan päiväsaaralassa ja potilailla on omahoitaja päiväsaaralahoitojen ajan. Vertailuaineisto kerättiin Oulun yliopistollisen sairaalan (Oulu) hematologian yksiköstä.

Tutkimuksessa tunnistettiin kuusi mahdollistajaa ja kaksi rajoitajaa liittyen sairaalahoidon modularisointiin. Vaikka terveydenhuollon erityispiirteet voivat haastaa modularisaation, sitä tukevilla toimintamalleilla voidaan kuitenkin selättää kyseiset haasteet. Modularisaatio voi sekä tukea että haastaa terveydenhuollon pal-

## Tiivistelmä

velutuotantoa. Toimintamalli voi tukea siirtymistä vuodeosastohoidosta kohti avohoitopainotteista hoitoa. Lisäksi modularisaatio voi virtaviivaistaa tiedonsiirtoa ja palvelutuotantoa ja tukea henkilöstön korvattavuutta. Toimintamallin käyttöönotto ei kuitenkaan välttämättä lisää potilaiden osallistumista eikä palveluotannon räätälöintiä ja se voi rajoittaa epävirallista tiedonsiirtoa. Potilaat voivat olla tyytyväisiä modulaarisesti järjestettyyn päiväsairaalahoitoon. Potilaskeskeisessä hematologian potilaat toivoivat onkologian potilaita harvemmin, että heillä olisi omahoitaja tai maksimissaan kolme hoitavaa hoitajaa päiväsairaalassa. Lisäksi päiväsairaalakäyntien ja hoitavien hoitajien lukumäärä vaikutti toiveisiin.

Tutkimus osoittaa, että modularisaatio voi tukea siirtymistä kohti avopainotteista hoitoa. Terveystuotannon organisaatioiden tulee kuitenkin arvioida räätälöinnin ja standardoinnin tasapainoa omassa palvelutuotannossaan, jotta toimintamallia voidaan tuloksellisesti hyödyntää. Potilaiden näkemyksiä ja preferenssejä toimintamallista tulee selvittää, sillä eri potilasryhmien näkemys modularisaation käytöstä voi vaihdella. Organisaatioiden on myös huomioitava terveydenhuollon erikoispiirteet, sillä ne voivat vaikuttaa modularisaation soveltuvuuteen ja tuloksiin organisaatiossa. Jatkotutkimuksia tarvitaan, jotta voidaan ymmärtää milloin ja mihin tilanteisiin modularisaatio terveydenhuollossa soveltuu. 🍷





# Introduction

**HEALTHCARE FACES MAJOR CHALLENGES** throughout the world. Aging populations, new technologies, and treatment possibilities together with rising costs challenge healthcare service production. At the same time, healthcare delivery continues to shift from specialty based inpatient-focused care to outpatient-focused care (OECD 2018), a shift also seen in specialties that have traditionally relied strongly on inpatient care, e.g. hematology. Today, many healthcare providers are moving towards multispecialty units and day hospitals.

As healthcare faces challenges, a need to enhance both population health and experiences of patients by simultaneously reducing costs is evident (BERWICK ET AL., 2008). Patients underline the need for their voices to be heard and call for services tailored to their needs. Patient satisfaction is a multifaceted concept that is affected by underlying factors such as patient-physician communication, accessibility to care, continuity of care, and the involvement of patients in decision-making (PATEL ET AL., 2011; PRAKASH, 2010; SÄILÄ ET AL., 2008). Both patient experience and satisfaction are seen as important aspects of patient-centered care (DELANEY, 2018; SÄILÄ ET AL., 2008; STANISZEWSKA AND HENDERSON, 2005).

On the other hand, strict budgetary restrictions call for efficiency and greater volumes. Thus, the demand for customization and patient-centeredness, and the demand for increasing service volumes conflict. Operations management models may support chang-

es needed in healthcare to overcome this conundrum. Modularization and mass customization are operations management models seen to have potential in enabling customization and variety in healthcare, while simultaneously taking advantage of both standardization and mass production (BERWICK, 1997; BOHMER, 2005; McLAUGHLIN AND KALUZNY, 2000; MEYER ET AL., 2007).

Mass customization is a production strategy that focuses on individualized products and services (DAVIS, 1989) and has often been defined as *developing, producing, marketing, and delivering affordable goods and services with enough variety and customisation that nearly everyone finds exactly what they want* (PINE, 1992, p.44). Modularization is seen as a means to achieve mass customization (DURAY ET AL., 2000; PINE, 1992) and in this thesis is defined as follows: *building a complex product or process from smaller subsystems that can be designed independently yet function together as a whole* (BALDWIN AND CLARK, 1997). In healthcare, clinical pathways are one example of modularization (McLAUGHLIN AND KALUZNY, 2000).

In services, modularization is assumed to contribute to benefits such as enhanced flexibility (BASK ET AL., 2011), increased variety (DE BLOK ET AL., 2013), and cost reductions (DURAY ET AL., 2000; EISSENS-VAN DER LAAN ET AL., 2016) as it reduces complexity in fragmented systems (SIMON, 1962). However, knowledge of the application of modularization in healthcare is scarce. Effects of modularization have been studied in healthcare (DE BLOK ET AL., 2013; MEYER ET AL., 2007; VÄHÄTALO AND KALLIO, 2015), but more evidence is needed, especially in specialized hospital care. As research findings regarding the effects of modularization in healthcare are inconclusive and as most studies focus on a conceptual perspective, more quantitative-level analyses of the

effects of modularization are needed (DÖRBECKER AND BÖHMANN, 2013). In addition, the need for more research of customer experiences and perspectives in service modularity is recognized (BRAX ET AL., 2017).

There is need to understand how modularity, a key to achieve mass customization, can be applied in specialized healthcare. What role do specific characteristics of healthcare and specialized healthcare play in modularization, what has to be done when healthcare services are modularized, what outcomes may modularization have on service delivery, and how do patients perceive the operating model?

This thesis focuses on modularization of hospital outpatient services. It aims to identify enablers, constraints and outcomes related to the modularization of outpatient care, and to identify patient preferences related to day hospital service delivery. The context of the study is modularized hematology care and non-modularized oncology care. 🍷







# Review of the literature

## Services

As services have developed, different schools of thought concerning services have emerged to conceptualize and characterize the core concept of the term “services”. The IHIP (intangibility, heterogeneity, inseparability, and perishability) perspective emerged in the 1980’s, and identified the main features of services as follows: immateriality or intangibility, heterogeneity, inseparability, and perishability (GRÖNROOS, 1998; PARASURAMAN, 1998; ZEITHAML ET AL., 1985). Since the 1980’s, as technological developments among others have changed services, many researchers have criticized and suggested new perspectives to the IHIP perspective (LOVELOCK AND GUMMESSON, 2004; VARGO AND LUSCH, 2004). The Service Dominant Logic (SDL) emphasizes the participation of customers in the co-creation of value (PAYNE ET AL., 2008; SAMPSON AND FROEHLE, 2006; VARGO AND LUSCH, 2008, 2004). Moeller (2010) on the other hand, focuses on a Resource Integration Model that underlines the perishability of the resources of producers, the heterogeneity of customer resources,

the immateriality of service contracts, and the inseparability of service production.

Services differ from products in various ways, mostly because of their immaterial construct in comparison to material products (ZEITHAML ET AL., 1985). First, although services are often performed in permanent facilities and are produced with the help of standard equipment, services, including healthcare services, are processes that do not have permanent physical manifestations (GRÖNROOS, 1998; ZEITHAML ET AL., 1985). In other words, services are immaterial or intangible (GRÖNROOS, 1998; EDGETT AND PARKINSON, 1993; MOELLER, 2010; PARASURAMAN, 1998). In addition, interfaces related to services often include people, information and rules. Thus, the boundaries and interfaces of services may not be observable. As an example, in healthcare, information sharing between different specialties and levels of care is carried out with the use of electronic patient record systems.

Second, the consumption and production of services are mostly inseparable (GRÖNROOS, 1998; PARASURAMAN, 1998; ZEITHAML ET AL., 1985; EDGETT AND PARKINSON, 1993) and services are perishable (ZEITHAML ET AL., 1985). Thus, a ser-

vice cannot be produced and stored in an inventory to be retrieved at another time. Coordination of demand and supply of services is thus important (EDGETT AND PARKINSON, 1993; PALMER AND COLE, 1995).

Third, because of the inseparability of service production and consumption, customer participation is a central feature of services and service production (GRÖNROOS, 1998; CHUNYAN XIE ET AL., 2008; MOELLER, 2010; PALMER AND COLE, 1995; VARGO AND LUSCH, 2008, 2004). Although it has been argued that service production may be carried out without customer participation (LOVELOCK AND GUMMESON, 2004), in general customers are seen as active participants in creating and producing services, thus participating in the co-creation of value (CHUNYAN XIE ET AL., 2008; PRAHALAD AND RAMASWAMY, 2004; VARGO AND LUSCH, 2004).

Fourth, as services are intangible and often labor-intensive, there is heterogeneity in the service itself and the service performance caused by differences between producers and customers through time (EDGETT AND PARKINSON, 1993; MOELLER, 2010). The heterogeneity of customer demand and resources cannot be ignored as it is seen to cause heterogeneity in service outcomes (MOELLER, 2010). In other words, it is difficult to standardize services (EDGETT AND PARKINSON, 1993).

### **5.1.1 Healthcare services**

Like other services, healthcare services can be seen as the integration of provider and patient resources in co-creating health. Patients and providers collaborate together to create better well-being (LILLRANK, 2018). Historically, healthcare was delivered by professionals as craftsmanship (MC LAUGHLIN AND KALUZNY, 2000). Thus, traditionally the patient-physician relationship has been the context in which the complexity and variety of healthcare services have been controlled. This has led to strong professionalism and

autonomy (SEE CRUSSF ET AL., 2002). Hierarchy between physicians and other healthcare professionals has been formed.

In addition, information asymmetry exists between patients and professionals (BLOMQVIST, 1991; LANSENG AND ANDREASSEN, 2007), a characteristic that is greater in healthcare compared to other services. It may challenge co-creation, as patients might not objectively differentiate their medical needs and wants (BERRY AND BENDAPUDI, 2007; LILLRANK ET AL., 2010). Patients may not want what they need (BERRY AND BENDAPUDI, 2007), or they might want something that they do not need and what healthcare professionals are not ready to carry out if it is seen to harm the patient more than create good (SOKOL, 2013). In addition, patients are often in stressful situations causing them to be more emotional, sensitive, demanding or dependent compared to what they would be as consumers in other service fields (BERRY AND BENDAPUDI, 2007). Thus, the demand, supply, and production of healthcare is a complex system, which is affected by, among other factors, patient needs and expectations, clinical indicators and symptoms, and the resources and capabilities of healthcare service providers (LILLRANK, 2018).

Healthcare services are often mostly publicly funded, and thus often require both standard and customized services due to different segments of patients, as the provider's duty is to treat those in need (BLOMQVIST, 1991; BOHMER, 2005). This consequently forbids healthcare service providers from choosing their patients and focusing production on certain segments of patients. Thus, there is a need for variety: both standardized and customized services are entailed because patient needs vary between individual patients and patient segments. In addition, patients may not only need and seek medical help; the need for social and psychological support is evident in many situations (BERRY AND BENDAPUDI, 2007; LILLRANK, 2018; MIRZA ET AL., 2008).

**TABLE 1**

Christensen et al. 's (2009) division of healthcare services

Categorization of healthcare	Definitions
intuitive medicine	Care for conditions that can be diagnosed only by their symptoms and only treated with therapies whose efficacy is uncertain (CHRISTENSEN ET AL., 2009, PP. 44).
empirical medicine	The practice of empirical medicine occurs when a field has progressed into an era of "pattern recognition" – when correlations between actions and outcomes are consistent enough that results can be predicted in probabilistic terms (CHRISTENSEN ET AL., 2009, PP. 45).
precision medicine	A provision of care for diseases that can be precisely diagnosed, whose causes are understood, and which consequently can be treated with rules-based therapies that are predictably effective (CHRISTENSEN ET AL., 2009, PP. 44).

Healthcare services are highly regulated; an aspect that affects service delivery and development, health data use, and technologies such as pharmaceuticals (SEE E.G. LÄÄKELÄKI, 1987; TERVEYDENHUOLTOLAKI, 2010). Similarly, medical research is highly regulated (SEE E.G. LAKI LÄÄKETIETEELLISESTÄ TUTKIMUKSESTA 1999; REGULATION (EU) No 536/2014, 2014). New technological improvements and service delivery models are created with a fast pace. This creates pressure to keep up with legislative changes and modernizations. As an example, the new regulations on medical devices were adopted, and entered into force in the European Union in 2017 (REGULATION (EU) 2017/746, 2017; REGULATION (EU) 2017/745, 2017).

In university hospitals, the need for variety is apparent, as they carry out secondary- and tertiary-level care. In university hospitals, patient needs vary from high-volume standardized medical care such as cataract surgery, to highly customized care needs. Thus, hospital patients often require services of many different professional groups such as various

medical specialists, nurses, authorized nutritionists, and physiotherapists. Today, different hospital services are often divided into blocks following medical specialties (PORTER AND LEE, 2013; VUORENKOSKI, 2008), which produce specialized services within the corresponding specialty needed by the patient. Consequently, services are divided between different service providers and departments and thus services that are similar may be carried out in various healthcare units not collaborating together in service production (YEN ET AL., 2010). Care coordination has been seen as important in linking information from different patient episodes or care providers together to tackle the challenge related to fragmented care (HAGGERTY ET AL., 2003). However, the use of different electronic patient record systems between providers and differences in how the systems are used, often hinder information flow.

Healthcare is not a homogeneous industry. Rather, it consists of separate fields reacting variably to managerial methods. Due to this inherent diversity, healthcare services have been divided in different ways to manage

heterogeneity (CHRISTENSEN ET AL., 2009; GLOUBERMAN AND MINTZBERG, 2001; HOPP AND LOVEJOY, 2012; LILLRANK ET AL., 2010). The categorization of healthcare services into intuitive, precision, and empirical medicine (CHRISTENSEN ET AL., 2009; HOPP AND LOVEJOY, 2012) or projects, care, cure, and processes (LILLRANK ET AL., 2010) follow the logic of the product-process matrix (HAYES AND WHEELWRIGHT, 1979A, 1979B). One of the most known categorizations is Christensen et al.'s (2009) division of services into intuitive, precision and empirical medicine, in which empirical medicine falls in between the other two categories (*Table 1*). In real-life, the categorization of healthcare services to Christensen's three categories may be challenging, as often care may be composed of all three categories at the same time. As an example, a patient may be treated with surgical care relying strongly on empirical evidence; however, the surgeon's decisions may be backed up with intuitive knowledge. The same patient may also be treated with highly specific drugs (precision medicine) that in reality cause unspecific harm that might be reduced with empirical and intuitive knowledge.

Lillrank et al. (2010) divide healthcare to demand and supply-based operating modes (DSO modes): Prevention, Emergency, One visit, Project, Elective, Cure, and Care. According to the authors, the model enables to structure current healthcare problems. As different healthcare services are often complex and may consist of many different modes, the priorities and goals of these services may conflict, as different modes operate in a different way (LILLRANK ET AL., 2010).

### **Operations management methods**

Operations management refers to the management of an organization responsible for producing goods and services (STEVENSON, 2005, p. 4). In operations management, the

focus is on converting inputs such as capital, information or labor into outputs, namely goods and services (STEVENSON, 2005, p. 4). From a service perspective, service operations management deals with the configuration of resources and processes that deliver the outcome, the service to the customer (JOHNSTON AND CLARK, 2005, p.5). As an example, in healthcare inputs may be e.g. physicians, nurses, equipment, and medical supplies. Processes that convert inputs into outputs may be tasks such as examining, monitoring or carrying out surgeries. The outcome should then be healthy patients. (STEVENSON, 2005, p. 6). In other words, healthcare services are intermediate products, while health is the ultimate product of healthcare (LILLRANK, 2018, p. 147). Quality of operations is an aspect taken into account in operations management. In healthcare, improving e.g. patient flow may increase quality of care (THOMPSON ET AL., 2013).

In services, customers can be seen as inputs as they take part in the service production (BITNER ET AL., 1997; JOHNSTON AND CLARK, 2005, p.249). Thus, it is important to understand the needs of customers to enable customer segmentation (JOHNSTON AND CLARK, 2005, p.78). As customers play an important role in operations management, satisfaction and experience have become an important focus aspect in the area (BITNER ET AL., 1997; HALLOWELL, 1996; JOHNSTON AND CLARK, 2005; ZHANG ET AL., 2003).

In this thesis, mass customization, modularization, and segmentation are defined as follows (*Table 2*).

### **Mass Customization**

Mass customization is a production strategy focusing on individualized products and services (DAVIS, 1989). Davis (1987) introduced the term during the 1980's and the term was expounded in the early 1990's by Pine (1992). Various approaches to mass customization have been introduced since (DA SILVEIRA ET AL., 2001; GILMORE AND PINE II,

**TABLE 2**

Definitions of mass customization, modularization, and segmentation used in this thesis.

Term	Definition
Mass customization	Developing, producing, marketing, and delivering affordable goods and services with enough variety and customisation that nearly everyone finds exactly what they want (PINE, 1992, P.44).
Modularization	Building a complex product or process from smaller subsystems that can be designed independently yet function together as a whole (BALDWIN AND CLARK, 1997).
Segmentation	Segmentation is to divide a set of entities into subgroups, segments, according to some criteria, such as age, sex, residence, ethnic group, profession, or income level (LILLRANK, 2018, P.101).

1997; HART, 1995; LAMPEL AND MINTZBERG, 1996; PINE, 1993; TSENG AND JIAO, 1996; TSENG AND PILLER, 2003), as the term has been challenging to define (HART, 1995). It is an operation management method that is closely linked to other operations management methods such as Lean and Agile production, as agility is needed in responding efficiently to individual demands and lean principles enable affordable customization (FOGLIATTO ET AL., 2012; GOSLING AND NAIM, 2009). Mass customization can be carried out in many ways, although it is mostly carried out through modularization (FOGLIATTO ET AL., 2012; PINE, 1992 P. 196). In real-life, Nike's program for designing shoes online is an example of mass customization (NEJM CATALYST, 2017; FATUR ET AL., 2007).

### **Modularity**

Modularity is a key means to enable mass customization (BOYNTON ET AL., 1993; GILMORE AND PINE II, 1997; PINE, 1993; PINE, 1992) and is a way to enhance and enable mass custom-

ization with products or services requiring variety (MIKKOLA, 2007). An often-used definition of modularity is Baldwin and Clarke's (1997), who define modularity as constructing complex products or processes from independently designed smaller subsystems that function together as a whole. When modularized, larger systems are divided into smaller parts (EISSENS-VAN DER LAAN ET AL., 2016; SIMON, 1962; VOSS AND HSUAN, 2009). These parts have clearly defined functions and interfaces (BÖTTCHER AND KLINGNER, 2011). The partitioning of a system into smaller parts is called decomposability (SIMON, 1962; VOSS AND HSUAN, 2009), and it is a core concept in modularity. De Blok et al. (2010a) describe four different levels of modularity: components, modules, interfaces, and packages or bundles. Components are the smallest unit of a service and modules consist of components (PEKKARINEN AND ULKUNIEMI, 2008). Interfaces connect different modules together (SALVADOR, 2007). Bundles of services or service packages are groups of modules packaged together to fulfill customer needs (DOCTERS ET AL., 2004).

In addition, in modularity, interdependencies between different modules are minimized compared to the interdependencies within modules (ETHIRAJ AND LEVINTHAL, 2004; SIMON, 1962) enabling the simplification and standardization of interfaces (SALVADOR, 2007). This standardization of interfaces connects services and service providers together (DE BLOK ET AL., 2014) thus enabling repetition of modules and hence, mass production (DURAY ET AL., 2000), and reduces costs of coordination (EISSENS-VAN DER LAAN ET AL., 2016). In addition, it enables reusability and sharing (PEKKARINEN AND ULKUNIEMI, 2008; SANCHEZ AND MAHONEY, 1996; VOSS AND HSUAN, 2009), and the combining of different modules and components (DE BLOK ET AL., 2010B; SCHILLING, 2000; SOFFERS ET AL., 2014; VOSS AND HSUAN, 2009). In other words, a modular service composition may allow services to be configured and assembled from a predefined set of service modules to fulfill customer needs (BOHMER, 2005; BÖTTCHER AND KLINGNER, 2011; DE BLOK ET AL., 2014).

Modularization of services is a rather new research area (BASK ET AL., 2010; FRANSEN, 2017). The operating model has not been widely applied to the design and production of services, although it has been seen as a significant concept (BALDWIN AND CLARK, 1997; VOSS AND HSUAN, 2009). Modularization is thought to simplify service production by separating complex systems into subsystems that are more manageable. Benefits such as increased variety, enhanced flexibility, and cost reductions, are considered possible in the modularization of services (BASK ET AL., 2010; CARLBORG AND KINDSTRÖM, 2014; PEKKARINEN AND ULKUNIEMI, 2008; VAN LIERE ET AL., 2004). However, there are trade-offs to be considered with modularization. It requires more efforts and resources during the design and development phase (BALDWIN AND CLARK, 1997) and standardization may reduce variety in modularized services (VÄHÄTALO AND KALLIO,

2015). In addition, the benefits of modularization might not compensate for the costs of the process (CHORPITA ET AL., 2005). The need for more research of customer experiences and perspectives in service modularity is recognized (BRAX ET AL., 2017).

Service characteristics such as immateriality, heterogeneity of demand, perishability, inseparability of service production and use, and customer participation in the co-creation of value (GRÖNROOS, 1998; LOVELOCK AND GUMMESSON, 2004; PARASURAMAN, 1998; SAMPSON AND FROEHLE, 2006; VARGO AND LUSCH, 2004) may challenge the creation of clearly defined modules and well-defined interfaces. Because service modules have a process-based nature and are immaterial, they are more flexible and may undergo variation (BASK ET AL., 2010; BRAX, 2013). Thus, visible design rules (BALDWIN AND CLARK, 1997) are required to define clearly both service modules and their interfaces.

Earlier studies have identified service modularization design aspects such as the decomposition of service offerings (EISSENS-VAN DER LAAN ET AL., 2016), the standardization of interfaces with design rules (BALDWIN AND CLARK, 1997; CHORPITA ET AL., 2005; PEKKARINEN AND ULKUNIEMI, 2008; VAN LIERE ET AL., 2004), and the mixing and matching of components (BASK ET AL., 2011). In addition, managing the heterogeneity of customer needs (RAHIKKA ET AL., 2011), and customer involvement (DE BLOK ET AL., 2010B, 2010A; DURAY ET AL., 2000; PEKKARINEN AND ULKUNIEMI, 2008) have been identified. However, as the production and use of services are perishable and inseparable, and customers have heterogeneous needs, the production of service requires adaptability, flexibility, and robustness (BRAX, 2013). These aspects may constrain the standardization of service modules and interfaces. Yet, prior studies show that the standardization of interfaces with design rules is feasible in service modularization (BALDWIN AND CLARK, 1997; CHORPITA ET AL., 2005; PEKKARINEN AND ULKUNIEMI, 2008; VAN LIERE ET AL., 2004).

In conclusion, modularization can be seen as a systems concept describing the level to which a system can be divided into components, and the level of coupling and recombination of the components (SCHILLING, 2000). In addition, the degree of modularity may range from an integral to a modular structure (CAMPAGNOLO AND CAMUFFO, 2009). As only few systems have parts that can be totally separated, and generally components are always coupled to some degree, nearly all systems can be seen as modular to some extent (SCHILLING, 2000).

### **Segmentation**

Segmentation can be defined as follows: “Segmentation is to divide a set of entities into subgroups, segments, according to some criteria, such as age, sex, residence, ethnic group, profession, or income level” (LILLRANK, 2018, P.101). The identification of customer needs and segments is important in service production as customers participate in service production (YAN ET AL., 2007). The assessment of different customer needs is linked to managing heterogeneity of demand in services (PEKKARINEN AND ULKUNIEMI, 2008; YAN ET AL., 2007). Customer segmentation is also seen as a general principle in modularization and mass customization (DURAY ET AL., 2000; PEKKARINEN AND ULKUNIEMI, 2008).

### **Healthcare operations management**

Service operations management deals with the configuration of resources and processes that deliver the outcome, the service to the customer (JOHNSTON AND CLARK, 2005, P.5). Similarly, healthcare operations management refers to the planning and control of the processes transforming inputs into outputs (VISSERS AND BEECH, 2005, P. 39). Operations management focusing on healthcare is needed, as healthcare characteristics such as information asymmetry (LANSENG AND AN-

DREASSEN, 2007), strong professionalism and autonomy (CRUESS ET AL., 2002), the requirement to treat all in need (BOHMER, 2005), and the need for both standardized and customized services (BOHMER, 2005) affect the demand, supply, and production of healthcare. In addition, the history of a certain organization or unit may play a role in the way, how organizations and units currently operate, as strong professionalism may have affected development and resourcing.

Healthcare has become more complex as treatments have improved and healthcare has fragmented into smaller and smaller specialties (ØVRETVEIT, 2000). Consequently, healthcare operations management faces operations management dilemmas related to coordination, control, and integration (LILLRANK ET AL., 2010; NIEMI ET AL., 2015). Different operations management models, such as Lean (BRANDAO DE SOUZA, 2009; D’ANDREAMATTEO ET AL., 2015; MAZZOCATO ET AL., 2010; ØVRETVEIT, 2000), Total Quality Management (DAHLGAARD ET AL., 2011; MCLAUGHLIN AND KALUZNY, 1997; ØVRETVEIT, 2000) and Theory of Constraints (GROOP ET AL., 2010; LUBITSH ET AL., 2005) have been used to support healthcare delivery.

No one operating model is applicable in all healthcare contexts (SA COUTO, 2008) as healthcare is a broad industry employing a large variety of technologies, methods, and resources to a huge variety of health problems. Current research has demonstrated that the results of operational methods vary in different healthcare areas, e.g. economies of scale do exist in some areas, but not in all (DRANOVE, 1998; LILLRANK ET AL., 2015). Similarly, the use of mass production in healthcare has been discussed, but it has been identified that it is not applicable in general to healthcare as not all healthcare services can be standardized (SA COUTO, 2008). Consequently, the outcomes of applying an operational management model such as Theory of Constraints, Total Quality Management or Lean require studies to understand the

applicability and outcomes to different kind of healthcare services (DAHLGAARD ET AL., 2011; D'ANDREAMATTEO ET AL., 2015; GROOP ET AL., 2010; MAZZOCATO ET AL., 2010).

In general, there are various ways of organizing healthcare provision. Nurse navigators are nurses that have various distinct tasks such as coordinating care, supporting a patient through e.g. cancer treatment, documenting patient information regarding treatments, and communicating with the patient between care provider visits (BERGLUND ET AL., 2015; JOHNSON, 2016). In Finland, the term coordinating nurse (*koordinoinva hoitaja*) is often used when referring to nurses with similar tasks to nurse navigators and the term named nurse (*omahoitaja*) when describing a nurse that is allocated to a patient during a certain treatment period in a certain unit and whom the patient can contact directly if needed. Tasks of named nurses have similarities to nurse navigation programs; however, named nurses are allocated to a patient only during a certain episode in a certain unit.

Nurse navigation programs aim to improve access to care, enhance patient education and care coordination, and link different community resources together (Case, 2011). It has been shown that minimizing the number of personnel members involved in cancer care is beneficial in supporting the formation of patient-personnel relationships during care (BARNET AND SHAW, 2013). Both continuity of care (BARNET AND SHAW, 2013; BERGENMAR ET AL., 2006; CAMPBELL ET AL., 2010), and communication and access to information (CAMPBELL ET AL., 2010; HARRISON ET AL., 2009; SÄILÄ ET AL., 2008) are important areas in outpatient and cancer care. Cancer patients have reported meeting the same nurse during different visits to be important (BERGLUND ET AL., 2015). Hence, healthcare coordinators, such as nurse navigators, have been seen as a way to increase continuity of

care and coordination with cancer patients (BERGLUND ET AL., 2015; CAMPBELL ET AL., 2010; CASE, 2011; MA, 2002; POST ET AL., 2015).

### ***Modularization in healthcare***

Modularity in general was discussed in section modularity. This section discusses modularization and its implications specifically in healthcare.

Healthcare modularization can be analyzed from different perspectives. From a medical perspective, clinical pathways are examples of modularity (MCLAUGHLIN AND KALUZNY, 2000). Consequently, choosing the right clinical pathway for a patient is an example of mass customization. On the other hand, different units of a healthcare provider, such as an outpatient clinic or a ward can be seen as modules from an organizational perspective. Altogether, the modularization of services in healthcare relates to the need for cooperation between healthcare service providers to increase the coordination of services (KUNTZ AND VERA, 2007) and the continuum of care (MEYER ET AL., 2007).

Healthcare consists of different fields, such as hospital care and elderly care, and thus different fields of the industry react to managerial methods, such as modularization, differently (DRANOVE, 1998; LILLRANK ET AL., 2015). In healthcare, there are characteristics that may contradict with modularity. Among others, the medical experience and discretion of experts, which may contradict with modularity, may affect decision-making and customized service delivery. Although there are services that are mass produced, the autonomy and professionalism of healthcare experts are nevertheless connected with healthcare services, leading to a paradoxical co-existence of both professionalism and mass production (MCLAUGHLIN AND KALUZNY, 2000). In addition, the steep information asymmetry between patients and professionals affects healthcare (LANSING AND ANDREASSEN, 2007) and constricts the co-creation of services, as patients may not dif-



ferentiate between their medical needs and wants (BERRY AND BENDAPUDI, 2007; LILLRANK ET AL., 2010).

Most of the empirical modularization studies focus on elderly or mental care (BROEKHUIS ET AL., 2017; BUSHE ET AL., 2008; CHORPITA ET AL., 2005; DE BLOK ET AL., 2014, 2010A, 2010B; SOFFERS ET AL., 2014; VAN DER LAAN, 2015; WEISZ ET AL., 2012), and fewer studies focus on hospital care (BOHMER, 2005; KUNTZ AND VERA, 2007; MEYER ET AL., 2007). To enhance continuity of care in modularized healthcare services, it is important to coordinate co-operation of different healthcare professionals. The use of single care plans may increase coherence in situations when various healthcare professionals treat patients (MEYER ET AL., 2007).

Standardized healthcare services may decrease information asymmetry, and standardized interfaces may improve patient flow (VÄHÄTALO AND KALLIO, 2015). In addition, modularization may allow the delivery of more adjustable yet structured and transparent healthcare services (DE BLOK ET AL., 2014; VÄHÄTALO AND KALLIO, 2015), and bring cost reductions through streamlining care coordination and information (BOHMER, 2005; MEYER ET AL., 2007; SOFFERS ET AL., 2014). However, studies also argue that it may affect costs in different ways (VÄHÄTALO AND KALLIO, 2015), and that the benefits of developing a modular treatment scheme may not outweigh the costs (CHORPITA ET AL., 2005). The strict specification of interfaces may also challenge professional autonomy (VAN DER LAAN, 2015), and it is not evident whether modularization increases (DE BLOK ET AL., 2013) or restrains (VÄHÄTALO AND KALLIO, 2015) customization. In addition, the decomposition of services into clearly specified modules with specific functions and the creation of standardized interfaces may be challenging to achieve in a healthcare context (BROEKHUIS ET AL., 2017). Nonetheless, standardization is required to suc-

cessfully implement modularization, although it may challenge modularization by restraining competition, customization, and new technological and service innovations (VÄHÄTALO AND KALLIO, 2015).

### *Patient satisfaction and experience*

As described previously, understanding customer satisfaction (in the case of healthcare, patient satisfaction) is a key aspect of operations management (BITNER ET AL., 1997; HALLOWELL, 1996; JOHNSTON AND CLARK, 2005; ZHANG ET AL., 2003). In healthcare, there is similarly a need to understand the needs, requirements, and expectations of patients to manage service production successfully. Patient satisfaction and experience are multifaceted concepts as they are affected by many different factors (BERWICK ET AL., 2017; COULTER, 2017; PATEL ET AL., 2011; SITZIA AND WOOD, 1997) and have been seen as important in quality of care (CLEARY AND MCNEIL, 1988; PATEL ET AL., 2011). Patient satisfaction is closely linked to health outcomes (PATEL ET AL., 2011), and satisfaction to care has been found to be positively correlated to adherence to care (MARTIN ET AL., 2005).

Patient satisfaction and perception are often used as synonyms, although this is not the case as satisfaction is an example of perception (SOFAER AND FIRMINER, 2005). There is no one definition for patient satisfaction (HENDERSON ET AL., 2004). Similarly, there is no one general tool to measure patient satisfaction (PERNEGER ET AL., 2003). Satisfaction relates to aspects such as the fulfillment of needs, desires, and expectations (SITZIA AND WOOD, 1997; WILLIAMS, 1994). Various underlying factors such as accessibility to care, patient-physician communication, continuity of care, and the involvement of patients in decision-making affect patient satisfaction (PATEL ET AL., 2011; PRAKASH, 2010; SÄILÄ ET AL., 2008). In their review, Mpinga and Chastonay (2011) identify the following concepts to be essential in patient satisfaction: “the quality and accessibility

**TABLE 3**

Determinants of patient satisfaction.

Determinants of satisfaction	Reference
fulfillment of expectations	Williams (1994); Jackson et al. (2001)
fulfillment of needs	Sitzia and Wood (1997)
quality of care	Sitzia and Wood (1997); Henderson et al. (2004); Watanabe et al. (2008); Mpinga and Chastonay (2011)
outcomes of care	Henderson et al. (2004)
accessibility and availability of care, e.g. waiting times	Williams (1994); Sitzia and Wood (1997); Henderson et al. (2004); Säilä et al. (2008); Mpinga and Chastonay (2011)
affordability	Mpinga and Chastonay (2011)
demeanor of caregivers, e.g. compassion, emotional support	Henderson et al. (2004); Boquiren et al. (2015)
skills, expertise, competency	Henderson et al. (2004); Boquiren et al. (2015)
patient-physician communication/ access to information	Henderson et al. (2004); Säilä et al. (2008); Mpinga and Chastonay (2011); Patel et al. (2011)
patient participation in decision-making	Henderson et al. (2004); Watanabe et al. (2008); Mpinga and Chastonay (2011);

of medical care, availability of health services and structures, affordability of costs, information and participation of the patient". Interpersonal characteristics, professional demeanor, skills and expertise of physicians affect patient satisfaction (BOQUIREN ET AL., 2015). When measuring patient satisfaction related to physicians, the perceived skills and humaneness of physicians are key components (BOQUIREN ET AL., 2015).

Patients often report to being satisfied with the care that they receive (SÄILÄ ET AL., 2008; STANISZEWSKA AND HENDERSON, 2005; WILLIAMS, 1994; WILLIAMS ET AL., 1998). However, this may not correlate with patient evaluations of the healthcare service that produces the experience (WILLIAMS ET AL., 1998). In addition, research has shown that most patients are rather uncritical regarding their care and thus only report dissatisfaction to care when care quality is extremely poor (WILLIAMS, 1994). It has also been shown that

patient satisfaction is higher if the measuring tools are filled in during visits compared to answers given at home after the visit (GASQUET ET AL., 2004). Researchers have identified that unmet expectations correlate with satisfaction (JACKSON ET AL., 2001). However, it is not clear, whether unmet expectation cause dissatisfaction or whether they act as a marker of dissatisfaction (JACKSON ET AL., 2001). Patient satisfaction of healthcare systems is complex, and only some of the affecting determinants have been identified leaving a gap in the understanding of factors determining satisfaction for health care systems (BLEICH ET AL., 2009). *Table 3* summarizes aspects that may affect patient satisfaction. However, the determinants of satisfaction of an individual patient remain mostly unknown (JACKSON ET AL., 2001).

#### **Patient segmentation in healthcare**

Healthcare can be segmented in different ways taking into account aspects such as patient needs and characteristics, the urgency and specialization levels of services, the different phases of healthcare delivery (e.g. screening, diagnosis, cure), or managerial aspects (CHRISTENSEN ET AL., 2009; LILLRANK ET AL. 2010; LILLRANK, 2018; LYNN ET AL. 2007). In patient segmentation, the identification, specification, and assessment of the patient needs is important (DE BLOK ET AL., 2014, 2010B; MEYER ET AL., 2007). The segmentation of patients into groups according to needs has been seen as a way to increase patient-centricity (EISSENS VAN DER LAAN ET AL., 2014; LILLRANK, 2018, p.218).

#### **Summary of Literature**

Mass customization and modularization are tightly linked to each other. However, both concepts have various definitions as the terms are challenging to define. Although modularization does not always lead to customization (DURAY ET AL., 2000), nor is it

the only way to mass customize, it is a key means to enable mass customization (BOYNTON ET AL., 1993; GILMORE AND PINE II, 1997; PINE, 1993; PINE, 1992). As services differ from products, the modularization and mass customization of services is more challenging than in the case of products.

Healthcare is a diverse service field including both similarities and dissimilarities with other services. The strong and steep information asymmetry between healthcare service producers and the patients may challenge co-creation in healthcare (BERRY AND BENDAPUDI, 2007; LILLRANK ET AL., 2010). In addition, the need to treat all in need and not only focus on a certain patients segment (BOHMER, 2005) may affect the use of modularity in healthcare. Similarly, regulations on healthcare delivery and development, and medical research have a strong effect on healthcare services.

The number of healthcare modularization studies is limited. Researchers have identified a need to study the effects of modularization on a quantitative basis (DÖRBECKER AND BÖHMANN, 2013) as prior research findings regarding the effects of modularization in healthcare are inconclusive and as most studies focus on a conceptual perspective. Researchers have also addressed the need to be able to combine standardization and customization in healthcare delivery (MINVIELLE ET AL., 2014). Thus, there is a need for more research on the application and outcomes of modularization in healthcare. 🧠



# Aims of the study

This study focuses on the modularization of hospital healthcare delivery. It aims to identify enablers, constraints and outcomes related to the modularization of healthcare services focusing on specialized healthcare, and to identify patient preferences related to modularized day hospital service delivery. The objective of this study is to answer the following questions:

1. What enablers and constraints are related to modularization in specialized hospital care?
  - a. *What has to be done to enable modularized service delivery in specialized outpatient care?*
  
2. What kind of outcomes, both qualitative and quantitative, are related to modularization in specialized hospital care?
  - a. *Is modularization associated with changes from inpatient to outpatient care?*
  - b. *How do personnel members perceive changes due to modularization?*
  - c. *How may modularization influence process and resource efficiency?*
  
3. What are patient preferences concerning modularization and named nurses? Are patients satisfied with modularized care?
  
4. How can the linkage between healthcare characteristics, enablers and constraints, and outcomes in modularization be conceptualized?

In this thesis, enablers, constraints, and outcomes are defined as follows (Table 4):

**TABLE 4**

Definition of enablers, constraints, and outcomes used in this thesis.

Term	Definition
enablers	conditions influencing their target favorably
constraints	conditions that hinder or prevent, or otherwise negatively influence their context
outcome	outcomes associated with the redesign of the service architecture based on modularization principles

The enablers can be either prerequisites or necessary conditions (cf. Dul et al., 2010). However, the enablers may not necessarily be fully responsible causes of the resulting condition in their context. The constraints do not necessarily fully prevent the expected condition. In other words, enablers refer to conditions and factors that are either prerequisites to modularization or influence modularization positively. Constraints refer to conditions and factors that hinder or prevent modularization. In medicine, the term outcome is often used to describe patient outcomes. However, in this thesis, outcomes are related to service production. 🍀

The following table (*Table 5*) demonstrates the connection of the articles to the research questions.

**TABLE 5**  
The connection of each article to the research questions.

Research question	Article I	Article II	Article III
What enablers and constraints are related to modularization in specialized hospital care?	X		
What kind of outcomes, both qualitative and quantitative, are related to modularization in specialized hospital care	X	X	
What are patient preferences concerning modularization and named nurses? Are patients satisfied with modularized care?			X
How the linkage between healthcare characteristics, and enablers, constraints and outcomes in modularization can be conceptualized?	X		





# Context, data and methods

## **Ethical considerations**

The Coordinating Ethics Committee of HUS approved the study plan. The study followed good research practice. All interviewees of semi-structured interviews, both personnel members and patients, were given written information of the study and gave written consent. Semi-structured interviews were transcribed and sent to interviewees. The patients questionnaires did not include identifiable information (name, address or social security number) of patients.

## **Context**

### ***Case description – intervention***

The main case organization of the thesis is HUS. The university hospital provides both secondary and tertiary healthcare including conservative, surgical and psychiatric specialties and serves a population of 1,6 million inhabitants in Southern Finland. It represents a highly complex service provider with a multiunit service architecture.

An interesting case study possibility generated this research project (cf. EISENHARDT, 1989; VOSS ET AL., 2002): a possibility to study a modularized day hospital that carries out standardized outpatient care to patients from different specialties within a larger university hospital. From HUS, two specific units, the hematology and oncology units that both belong to the Comprehensive Cancer Center were included. These units were chosen, because they represent different ways of delivering day hospital care: the oncology unit functions in a more traditional way from a service-delivery perspective (in other words is non-modularized) whereas the hematology unit functions in a modularized way.

### ***Hematology and the independent day hospital – modularized service architecture***

In the past, it was established for a hospital specialty to have a day hospital for its patients. In 2010, a new independent day hospital (The Meilahti Triangle Hospital's day hospital) was established in HUS. During this process, treatments and procedures of over 20 specialties were standardized and centralized to the new independent nurse-led day hospital. The new day hospital was designed to enhance outpatient care delivery through greater volumes and thus support the shift from inpatient to outpatient care. The modularization process was carried out by medical professionals and was not described as modularization during the

**TABLE 6**

The service architecture of hematology and oncology care in HUS

	Specialty/organization	Unit	Responsibility
Hematology	Hematology	Hematology ward	inpatient care
	Hematology	Outpatient clinic	outpatient visits without treatments or procedures
	Meilahti Triangle hospital 's day hospital	Independent day hospital	outpatient procedures and treatments of hematology patients
Oncology	Oncology	Oncology wards	inpatient care
	Oncology	Outpatient unit	outpatient visits without treatments or procedures (outpatient clinic) treatments and procedures (day hospital)

development process. However, when retrospectively studied, the reengineering of the day hospital services and the creation of the independent day hospital fulfill modularization criteria.

Hematology is one of the 20 specialties that carry out their day hospital services in the new independent day hospital. The independent day hospital produces approximately 16,000 treatment or procedure visits annually, of which, approximately 50% are hematology patient visits. Thus, hematology is the largest service user of the day hospital. Eighty different procedures and treatments to over 20 medical specialties are carried out in the day hospital. As the treatments and procedures are standardized, in general all nurses, approximately 20, can carry out all the services produced in the day hospital. The day hospital functions as an outsourced

activity as different medical specialties book services from the day hospital to fulfill their patient needs.

Today, the hematology unit functions with a modular service architecture and hematology services are carried out in three different units (*Table 6*). The day hospital is an independent, nurse-led unit, and is not part of the hematology unit, although day hospital services for hematology patients are carried out in the day hospital.

#### **Oncology – Traditional service architecture**

The oncology unit has a service architecture that can be characterized as traditional. Inpatient care is carried out in wards, and outpatient care is provided in the outpatient unit (*see Figure 1, Article 1*). The service architecture of oncology is described in *Table 6*. Physicians and nurses work closely together in wards and the outpatient unit. All personnel members belong to the same

organization (the Department of Oncology). Only oncology patients are treated in the day hospital, in which approximately 20,000 treatment sessions are carried out annually. All patients are assigned a named nurse, who carries out the patient's treatment scheme in the day hospital. Patients can contact the nurse directly between visits during their treatment phase. Before modularization, the hematology unit worked in a way that had similar characteristics to the current oncology unit with the exception of named nurses.

## Data and methods

### Data

#### *Semi-structured interviews*

During 2015, 16 semi-structured interviews with open questions and verifying closed questions were carried out to enable the collection of detailed, first-hand information of the traditional (oncology) and modularized (hematology) operating models (see appendices for interview outline). Different healthcare personnel members from HUS from different levels of the organizational hierarchy, groups and functional areas were interviewed to limit informant bias (EISENHARDT AND GRAEBNER, 2007): four physicians, three nurses, and one ward clerk in the hematology unit and two physicians, five nurses, and one ward clerk in the oncology unit. Notes were taken during the interviews. The interviews were recorded and transcribed; the transcriptions were sent to interviewees to verify accuracy and correctness (JOHNSTON ET AL., 1999).

#### *Quantitative data*

Quantitative data from the hematology unit and independent day hospital of HUS was obtained between 2009–2010 and 2013–2014. The data included service usage of 5097 patients. The quantitative data included bed counts, service usage data and

personnel resource information converted into full-time equivalents (FTEs) (see tables 8, 9, and 10).

#### *Supporting interviews*

Additional unstructured interviews of key hematology personnel members were conducted (three nurses and one physician) face to face, on the phone or by email. These interviews were conducted to support quantitative analyses of data from the hematology unit of HUS and to verify the findings of the quantitative analyses. These unstructured interviews were not recorded; notes were taken.

#### *Other supporting data*

Field visits to the hematology and oncology units and the Meilahti Triangle hospital's day hospital were organized. In addition, treatment instructions from both the hematology and oncology unit and scheduling instructions of the independent day hospital (Meilahti Triangle hospital day hospital) were analyzed.

#### *Reference data*

Reference data on changes in hematology care were obtained from Oulu University Hospital (Oulu). The reference hospital is situated in a sparsely populated area in Northern Finland. The quantitative data were collected from the hospital's databases, and three interviews (chief physician and two ward clerks) were conducted to verify the service delivery model and the data from the hospital databases. Notes were taken during the phone interviews. The research team had access only to population-level usage data; diagnoses were not available. The reference data were collected to understand the context and the general development of hematology care in Finland.

The reference hospital's hematology unit treats similar patient groups as the hematology unit of HUS. However, allogeneic stem cell transplantations are not carried out in Oulu. The outpatient services of hematology

gy care in Oulu are traditionally organized from a delivery service perspective and the unit has its own day hospital. The operating model of Oulu is similar to that of HUS hematology before the modularization process in 2010. Due to the sparsely populated area of Oulu, patients must often travel long distances to physical visits. Thus, the hospital has decreased visits by using telephone contact instead.

#### *Interviews and questionnaires to patients*

A survey was carried out to oncology and hematology patients in HUS (see appendices for Finnish versions of the questionnaire). First, five patients of different ages with acute lymphatic leukemia, breast cancer, colon cancer, or melanoma were interviewed to support the development of the questionnaire and to understand how patients perceive service delivery (see appendices for interview outlines). The semi-structured interviews were transcribed and sent to the patients to check for validity (JOHNSTON ET AL., 1999).

Nurses of the hematology and oncology units of HUS distributed and collected the questionnaires. Nurses distributed 410 questionnaires to oncology patients in the day hospital and the outpatient clinic between April and May of 2016 and 300 questionnaires to hematology patients in the (modularized) day hospital and the hematology outpatient clinic between April and September of 2016. Questionnaires with completed answers to the three following main questions ( $n = 445$ ) were included in the study:

- I am satisfied with the care I have received in the day hospital (5-point Likert scale).
- It is important that I would have a named nurse in the day hospital (5-point Likert scale).

- I wish that the following maximum number of nurses would treat me in the day hospital (multiple choice).

The Likert scale questions had five options: strongly agree, agree, neither agree nor disagree, disagree and strongly disagree. The third question regarding number of nurses included the following multiple-choice answer options: 1 nurse, 2 nurses, 3 nurses, 4 to 5 nurses, 6 to 10 nurses, more than 10 nurses and no preference concerning the number of treating nurses.

The following background information was documented (*see Figure 1 in Article III*): Gender, age, condition treated for, other chronic conditions requiring medication, first year treated in day hospital, number of visits to the day hospital during the last year for treatment, number of different treating nurses in the day hospital during the last year.

Table 7 summarizes the different data sources used in each article.

## **Methods**

### **Article I**

A comparative case analysis (VOSS ET AL., 2002) was carried out to identify differences between the service architectures of a modularized hematology unit and a non-modularized oncology hospital unit in HUS. In addition, constraints and enablers related to the design and use of modularity and identified outcomes related to the modularization process were analyzed. Following purposive sampling (BARRAIT ET AL., 2011; EISENHARDT AND GRAEBNER, 2007; PATTON, 2002) two specialties were chosen: hematology and oncology as patients in these two specialties have similar service delivery needs, but their service delivery is organized differently. To gather a full range of evidence in the specialized healthcare context (YIN, 2003), an exploratory, inductive case study method was selected.

First, a within-case analysis was conducted, followed by the second phase, a cross-

**TABLE 7**

The data sources used in each article. The data were collected from HUS unless otherwise indicated.

Data source	Number	Article I	Article II	Article III
semi-structured interviews hematology unit	8 interviews	X	X	
semi-structured interviews oncology unit	8 interviews	X		
supporting interviews	4 interviews		X	
other supportive data		X	X	
quantitative data	5097 patients		X	
reference data (Oulu)	3 interviews; population-level data		X	
interviews of patients	5 interviews			X
survey to patients	710 delivered, 445 completed surveys			X

case analysis (EISENHARDT, 1989; MILES ET AL., 2014) of the two cases. In the within-case analysis, the transcribed interview data of oncology and hematology were independently analyzed and manually coded and first-level observations were identified in both cases. The translation of direct observations into coded categories requires interpretation of the subject by the analyst doing the coding (GLASER AND STRAUSS, 2009). Treatment instructions from both cases were identified to verify interview findings.

In the second phase, the cross-case analysis, the first-level observations of hematology and oncology were compared, and the first-level observations that were found only in hematology were included in the further analysis as oncology was a negative

case with no modularization. This strategy enabled the researchers to focus on findings that were present only in hematology, as the characteristics that may be inherent to the studied hospital, and correspondingly, to specialized hospital service production in general, could be eliminated. The included first-level observations were arranged under second-level concepts based on inductive analysis. In the end, a framework to combine the characteristics of specialized hospital services, activities to enable the design of modular service architecture, and outcomes of the system was developed.

#### **Article II**

An exploratory mixed methods case study was carried out (YIN, 2003). Following a purposive sampling logic (EISENHARDT AND GRAEBNER, 2007; PATTON, 2002), the study included the he-

**TABLE 8**

Output measures and definitions. Modified and reprinted from the original article with the permission of SAGE Publications Ltd.

Output Measures	Definition
<b>Patients</b>	Total amount of patients in hematology unit
<b>Inpatients</b>	Total amount of patients with admission to hospital, treated in wards
<b>Outpatients</b>	Total amount of patients without admission to hospital
<b>Inpatient episodes</b>	Total number of treatment periods of individuals patients in wards, i.e. inpatient episodes in wards
<b>Inpatient net days</b>	Number of net days in wards, calculated as discharge day minus admission day. If the discharge and admission day were the same (same day discharge episode), the value of net days = 1. (NORDDRG-OPAS Suoritekäsikirja, 2016)
<b>Same day discharge episode</b>	Inpatient episodes in which discharge day same as admission day
<b>Visits</b>	Physician or nurse appointments in outpatient care
<b>Treatment and procedure visits</b>	Treatments and procedures carried out as outpatient care. Patient not admitted to hospital.
<b>Other outpatient contacts</b>	Other contacts than visits in outpatient care: calls, letters and consultations.

matology unit of HUS in which modularization has been applied and the Oulu University Hospital as a reference hospital with traditional service delivery. The study explored how modularization may support the transition from inpatient- to outpatient-focused services in hospital care and how this transition may influence process and resource efficiency. The output measures, process measures, and resource efficiency measures are listed in *Tables 8, 9, and 10*. Inductive analysis of the semi-structured interviews of HUS (hematology care) was carried out to categorize and group interview findings related to service outcomes (EISENHARDT, 1989).

ize and group interview findings related to service outcomes (EISENHARDT, 1989).

#### *Statistics*

In the quantitative analysis, results of 1/2009–10/2010 (before modularization) were compared with results of 1/2013–10/2014 (after modularization) to analyze the changes in process measures and resource efficiency measures. When applicable, statistical analysis with SPSS Statistics 23 with Independent-Samples Mann Whitney U Test (null hypothesis = distribution of analyzed measures [such as episodes or visits] is the same between the two time periods, i.e., for January 2009–Oc-

**TABLE 9**

Process measures (main variables) and definitions. Modified and reprinted from the original article with the permission of SAGE Publications Ltd.

Process Measures	Definition
<b>Inpatient episodes / patient</b>	Average number of episodes per patient in inpatient care
<b>Average length of stay</b>	Average length of stay during one inpatient episode. Length of stay calculated as discharge day minus admission day.
<b>Average length of stay without same day discharge episodes</b>	Average length of stay during one inpatient episode without same day discharge episodes. Length of stay calculated as discharge day minus admission day.
<b>Visits/patient</b>	Average number of visits per outpatient patient
<b>Other contacts / patient</b>	Average number of other contacts per outpatient patient

**TABLE 10**

Resource efficiency measures (secondary variables) and definitions. Modified and reprinted from the original article with the permission of SAGE Publications Ltd.

Resource efficiency measures	Definition
<b>Patients / FTE<sup>a</sup></b>	All patients / All nurse and physician FTE 's carrying out services to hematology patients
<b>Inpatients / inpatient FTE<sup>a</sup></b>	Number of inpatients / FTE 's allocated to inpatient care
<b>Outpatients / outpatient FTE<sup>a</sup></b>	Number of outpatients / FTE 's allocated to outpatient care
<b>Visits / outpatient FTE<sup>a</sup></b>	Number of outpatient visits / FTE 's allocated to outpatient care
<b>Treatment and procedure visits / outpatient FTE<sup>a</sup></b>	Number of treatment and procedure visits in outpatient care / FTE 's allocated to outpatient care
<b>Utilisation rate of beds<sup>b</sup></b>	Number of total gross inpatient days / capacity of beds

<sup>a</sup>FTE = Full Time Equivalent; <sup>b</sup>The utilisation rates of beds was calculated with gross inpatient days = discharge day – admission day + 1 day.

tober 2010 and January 2013–October 2014) was carried out, because the metrics were not normally distributed. The changes (%) were compared with changes reported from the reference hospital where modularization had not been applied to understand the changes in the general hematology service context. Finally, the qualitative and quantitative findings were combined together.

### **Article III**

Similarities and differences in patient preferences regarding the organization of care were explored in a modularized day hospital treating hematology patients and an oncology day hospital treating oncology patients. Patient preferences related to named nurses and the number of treating nurses in day hospital care were studied. Additionally, patient satisfaction of the care received in the hematology and oncology units was assessed.

Questionnaires with completed answers to the three main questions ( $n = 445$ ) were included in the study. In the regression analyses, only questionnaires that had complete answers to all included background and dependent variable questions ( $n = 380$ ) were included. Descriptive data on the respondents' background information, preferences and satisfaction with day hospital care were documented.

### *Statistics*

Statistical analyses were carried out with SPSS version 23, and a significance level of 0.05 was used. Binomial logistic regressions were performed to ascertain the effects of specialty, gender, age, other diseases, first time (year) in day hospital, number of times treated in day hospital during last year, and number of treating nurses in day hospital on the likelihood that participants would i) prefer having a named nurse in the day hospital and ii) prefer having 1–3 nurses to treat them in the day hospital. 🍷







# Key Findings

## Enablers and constraints related to modularization in specialized healthcare

Based on the interviews, two constraints and six enablers related to the modularization of hematology care were identified (*Table 11*).

At first, *the plan of creating a modularized day hospital led by nurses was challenged* (Constraint 1). The constraint was tackled by reinforcing autonomous professionalism between physicians. During modularization, the hematology outpatient clinic documented instructions how to produce the procedures and treatments provided in the day hospital to hematology patients. To facilitate this documentation process, *design rules* of how to document the day hospital instructions (Enabler 1) were created to ensure that all relevant information is documented in the instructions in the same way. In addition, *the ownership of module design and execution was separated* (Enabler 2) between day hospital management and personnel, and outpatient clinic personnel to support modularization.

Responsibilities and work tasks between personnel groups were documented, clarified, and rearranged (*clear division of work tasks*, Enabler 3), and the day hospital management *created documented scheduling rules* (Enabler 4). Patient segments, which could be treated in the day hospital, were identified and *patient-selection criteria* (Enabler 5) were developed to support this. To streamline communication, *communication rules* between the outpatient clinics and the day hospital (Enabler 6) were created. When HUS started to use the new service model,

**TABLE 11**

Enablers and constraints of the modularization of the hematology service production in HUS. Modified and reprinted from the original article with the permission of Emerald Publishing Limited.

Enablers and constraints	Description
Enabler 1	Creation of design rules for module design
Enabler 2	Clear separation of ownership of modules and design rules
Enabler 3	Clear division of work tasks
Enabler 4	Creation of scheduling rules
Enabler 5	Creation of criteria for patient and component selection
Enabler 6	Creation of communication rules and channels between outpatient clinics and day hospital
Constraint 1	Resistance in design of modules and work tasks
Constraint 2	Too wide a range of different instructions for packaging

a new constraint (Constraint 2) related to the *packaging of services* of the different specialties by ward clerks was identified. Ward clerks were assigned specific tasks to facilitate the packaging of different services. In addition to enablers and constraints, the results showed that patient involvement was nonexistent in the design of day hospital services.

### Outcomes of modularization

Outcomes of modularization in hematology unit of HUS were identified. *Table 12* summarizes the qualitative outcomes related to the modularization of the day hospital in HUS, identified in Article I.

After modularization, *all nurses* have been able to *carry out nearly all of the approximately 80 standardized treatments and procedures*

*in the day hospital* (Outcome 1). According to the professionals interviewed, supply and demand are easier to balance as patient volumes are larger. The standardization of day hospital services has *streamlined service production* (Outcome 2) and *communication* (Outcome 3). Modularization has enabled the hospital to close a ward. According to interview findings, treatments are approximately 30% cheaper to carry out in the day hospital compared to wards.

In addition to positive effects on service production, modularization has brought about new challenges. In the new day hospital *less variety and customization* of service components is possible (Outcome 4), affecting patients groups, such as clinical-trial patients, requiring both standardized day hospital services and customized services that are not carried out in the independent day hospital. After modularization and the re-

**TABLE 12**

Outcomes related to modularization in HUS, identified in Article I.  
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Outcome	Description
Outcome 1	All nurses carry out all components
Outcome 2	Streamlined service production
Outcome 3	Streamlined official communication
Outcome 4	Standardization carried out inside modules, less variety and customization of service components
Outcome 5	Loss of unofficial communication and relationships
Outcome 6	Loss of ownership of service production and challenge to develop modules further
Outcome 7	Less flexibility in communication with patients

allocation of personnel to different organizations, there has been *less informal communication between personnel from different modules* (Outcome 5), resulting in less informal relationships and collaboration between personnel members of different organizations or personnel groups. The modularization and the separation of outpatient care into two units has led to a *loss of ownership* of service production and has *challenged further development of modules* (Outcome 6).

After modularization, *communication with patients* has become *less flexible* (Outcome 7). Patients do not have named nurses in the day hospital whom they can contact when questions arise during treatment phases. In cases of sudden changes requiring patient notification, outpatient clinics are required to contact patients regarding this informa-

tion, although the changes have occurred during day hospital care.

The results of Article II suggest that modularization may support the shift from inpatient to outpatient care (Table 13, see also Article II Tables 2 and 3). The hospital could decrease hematology beds from 38 to 32. Process measures show that in HUS individual patient care has shifted from an inpatient focus toward a more outpatient focus in hematology care as patients had fewer inpatient episodes (-13%) and more visits (42%) after modularization. These changes however, were not statistically significant. At the same time, same day discharge episodes decreased by 65% ( $p < 0.0005$ ) in the hematology unit of HUS. The results related to resource efficiency were polarized and indicate that modularization may not automatically increase nor decrease resource efficiency.

**TABLE 13**

Changes in outcome measures in the modularized hematology unit of HUS and the reference hospital, Oulu University Hospital 's hematology unit. Modified and reprinted from the original article with the permission of SAGE Publications Ltd.

Measures	January 2013 to October 2014	
	Number	
	Patients	3267
Outpatient visits	22,970	
Treatment or procedure outpatient visits	13,661	
Inpatient episodes	1407	
Same-day discharge inpatient episodes	65	
<b>Primary variables: Process measures</b>	<b>Mean</b>	<b>Percentiles (10;90)</b>
Inpatient episodes/inpatienta	2.5	(1;6)
Outpatient visits/outpatient	8.8	(1;24)
<b>Secondary variables: Resource efficiency measures</b>	<b>Ratio</b>	
Patients/FTE	19.4	
Outpatients/ outpatient FTE	59.1	
Outpatient visits/outpatient FTE	430.8	
Treatment and procedure outpatient visits/outpatient FTE	256.3	
Bed utilisation rateb	0.87	

FTE: full-time equivalent; NA: not available. \*Statistically significant at  $p < 0.05$ .<sup>a</sup>Change between 2009 and 2014 in the reference hospital. <sup>b</sup>The bed utilisation rate was calculated with gross inpatient days = discharge day – admission day + 1 day.

MODULARIZED HEMATOLOGY UNIT (HUS)				REFERENCE HEMATOLOGY UNIT (OULU)
January 2009 to October 2010		January 2013 to October 2014 vs. January 2009 to October 2010		2013–2014 vs. 2009–2010
Number		Change (%)	Significance of change	Change in reference unit (%)
2799		+17%		+18%
15,096		+52%		+37%
8892		+54%		NA
1525		-8%		-14%
187		-65%	$P < 0.0005^*$	NA
Mean	Percentiles (10;90)	Change (%)	Significance of change	Change in reference unit (%)
2.8	(1;7)	-13%	$p = 0.194$	+4%
6.2	(1;16)	+42%	$p = 0.284$	+16%
Ratio		Change (%)	Significance of change	Change in reference unit (%)
19.5		-1%		+31%
67.9		-13%		0%
380.2		+13%		+16%
223.4		+15%		NA
0.77		+13%		NA

Figure 1 shows the combined service delivery and production outcomes identified from interviews and the quantitative data findings (Article II). Both the qualitative and quantitative findings were aligned suggesting that modularization had supported the shift toward outpatient care and the shortening of treatment times.

**Patient preferences concerning named nurses and patient satisfaction**

Nearly 80% of the oncology questionnaires and over half of the hematology questionnaires were returned. Altogether 445 questionnaires were categorized as completed. Ultimately, 380/445 (85%) of the completed questionnaires were included in the two re-

**FIGURE 1**

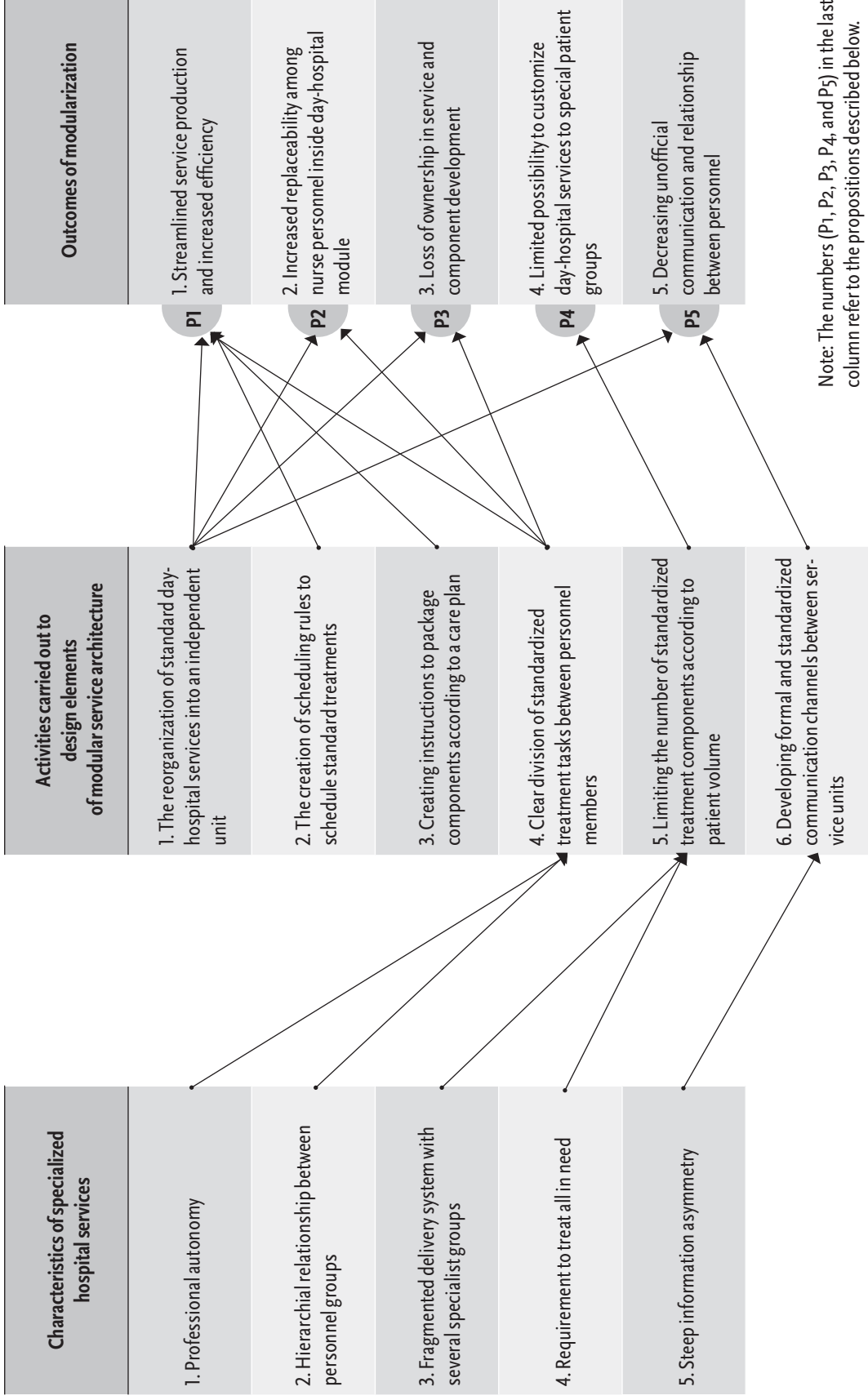
Qualitative interview findings and quantitative findings combined, Article II. Modified and reprinted from the original article with the permission of SAGE Publications Ltd.

Synthesis of service delivery and production outcomes from interviews	Quantitative data findings related to service delivery and production outcomes
Balance between demand and supply	<ul style="list-style-type: none"> <li>• No data related to queus or waiting times available</li> </ul>
Shorter treatment times	<ul style="list-style-type: none"> <li>• Inpatient episodes decreased</li> <li>• Inpatient net days decreased</li> <li>• Inpatient episodes/patient decreased</li> <li>• Outpatient visits/patient increased</li> </ul>
Improved management of service production	<ul style="list-style-type: none"> <li>• The average length of stay without same-day discharge episodes shortened in the wards.</li> <li>• The inpatient episodes in wards/patient decreased and at the same time outpatient visits/patient increased</li> </ul>
Support in shift from inpatient to outpatient care	<ul style="list-style-type: none"> <li>• The bed count could be decreased from 38 to 32</li> <li>• The bed utilization rate increased</li> </ul>



**FIGURE 2**

A framework combining specialized hospital service characteristics, activities carried out to design modular services, and outcomes of modularization. Modified and reprinted from the original article with the permission of Emerald Publishing Limited.



Note: The numbers (P1, P2, P3, P4, and P5) in the last column refer to the propositions described below.

gression analyses, 65 (15%) questionnaires had missing values. Table 1 in Article III demonstrates patients' self-reported characteristics. Both patient groups were satisfied with the care they had received in the day hospital (Article III, Table 2). Nearly all of the oncology patients strongly agreed or agreed that they preferred having a named nurse, whereas less than half of the hematology patients answered similarly. Most oncology patients preferred a maximum of three treating nurses; nearly half of the hematology patients had no preference regarding the maximum number of treating nurses in the day hospital. (Silander et al. unpublished results).

Oncology patients preferred named nurses and a maximum of three treating nurses in day hospitals more often than hematology patients (see Table 3 in Article III). The results also showed that the number of visits and treating nurses in the day hospital affected patient preferences regarding number of treating nurses and named nurses. (SILANDER ET AL. UNPUBLISHED RESULTS).

### **Conceptualization of linkage between healthcare characteristics, and enablers, constraints and outcomes of modularization**

A framework combining characteristics of specialized hospital services, enabling activities related to the design of a modular service architecture, and outcomes of modularization was developed. It is based on the description of the service architecture of the modularized hematology unit and the identified constraints, enablers, and outcomes of modularization.

*Figure 2* demonstrates the framework and *Table 14* shows the five propositions that link characteristics of specialized hospital services, the six design activities, and the five outcomes. 🍷

**TABLE 14**

Propositions linking specialized hospital characteristics, six design activities, and five outcomes. Modified and reprinted from the original article with the permission of Emerald Publishing Limited.

<b>Propositions of the framework</b>	
<b>Proposition 1</b>	The reorganization of standard service components into a separate unit with clear task division, scheduling rules, and instructions promotes streamlined service production and increased efficiency.
<b>Proposition 2</b>	Clear division of tasks between professionals and the standardization of service components enable increased replaceability among personnel and more robust human resource management.
<b>Proposition 3</b>	Professional autonomy combined with hierarchical relationships constrains the standardization and task division between personnel groups. This, together with reorganizing services into independent units, challenges modular system improvement through diminished ownership of service development.
<b>Proposition 4</b>	Combined with the requirement to treat all in need, the fragmented delivery system involving several specialist groups constrains the standardization of all services. Standardization limits possibilities to provide services for special patient groups.
<b>Proposition 5</b>	Formal and standardized communication channels between separated service units constrain informal communication and relationships between personnel, increasing information asymmetry between professionals.



# Discussion

**MODULARIZATION IN** healthcare is a rather new research area and thus research is needed to understand the applicability, requirements, and outcomes of modularization in different healthcare contexts. Little is known of patient preferences and satisfaction related to the modularization of healthcare services. This thesis work is the first comprehensive study to explore the enablers, constraints, and outcomes of modularization in addition to patient preferences and satisfaction related to the modularization of outpatient care services in specialized hospital care.

## Enablers and constraints

The findings related to enablers and constraints are in line with earlier studies. In the Triangle Hospital, the day hospital was decoupled from the rest of service production (in the studied case hematology service production), and interdependencies between the day hospital and outpatient clinics were minimized through planning rules

and standardized interfaces (BALDWIN AND CLARK, 1997; CHORPITA ET AL., 2005; PEKKARINEN AND ULKUNIEMI, 2008; VAN LIERE ET AL., 2004). The findings revealed that personnel showed resistance towards the design of modules and allocation of work tasks to create a nurse led day hospital. This may be linked to hierarchies between professionals and professional autonomy, a characteristic identified by researchers before (VAN DER LAAN, 2015).

Prior studies have identified design aspects of service modularization such as decomposing service offerings (EISSENS-VAN DER LAAN ET AL., 2016), STANDARDIZING INTERFACES WITH PLANNING AND DESIGN RULES (BALDWIN AND CLARK, 1997; CHORPITA ET AL., 2005; PEKKARINEN AND ULKUNIEMI, 2008; VAN LIERE ET AL., 2004), and managing the heterogeneity of customer requests (RAHIKKA ET AL., 2011). However, prior studies have not focused on the identification and description of enablers or con-

straints. This study focused on understanding how characteristics of contexts, i.e. in this case specialized hospital care, particularly hematology, may affect modularization.

The importance of patient and public involvement in health services research and development of healthcare delivery has been identified (CRAWFORD, 2002; FLORIN, 2004; WIERING ET AL., 2017; CHUDYK ET AL., 2018). In oncology care, the importance of patient involvement in care delivery development has been recognized and is part of the mission of the Organisation of European Cancer Institutes (OECI PROJECT, 2019). Similarly, customer involvement has been considered an important aspect of modularization in prior studies (DE BLOK ET AL., 2010A, 2010B; DURAY ET AL., 2000; PEKKARINEN AND ULKUNIEMI, 2008). However, in this study, clear patient involvement was not found to be present in the design of modular day hospital services. It is possible that the minor involvement of patients is due to the steep information asymmetry between patients and professionals (LANSENG AND ANDREASSEN, 2007; VÄHÄTALO AND KALLIO, 2015). The findings suggest that patient (or customer) involvement is not a mandatory prerequisite for modularization, but rather an enabler.

### Outcomes

Healthcare modularization outcomes were analyzed in two articles (*Articles I, II*). Both positive and challenging service delivery and organizational outcomes of modularization were found. The study demonstrated through qualitative and quantitative findings that modularization is a means that can be used to support a shift from inpatient- to outpatient-focused care. The standardization of interfaces and treatments, clear rules for scheduling and patient selection support a shift from inpatient- to outpatient-focused care.

Modularization streamlined service production and patient flow. In addition, some treatments that had earlier been provided in wards could be moved to outpatient care. It also increased the replaceability of day hospital personnel members as today nurses can carry out nearly all treatments and procedures of the new Triangle Hospital day hospital. This supported the shift from inpatient- to outpatient-focused care in the hematology unit of HUS. The findings also indicated that modularization enhanced the balance between demand and supply and shortened treatments times. This was seen in both output measures and process measures as inpatient episodes and inpatient net days decreased as well as inpatient episodes per patient. At the same time outpatient visits increased, both in total and on patient level. As inpatient care is more expensive than outpatient care in Finland (KAPIAINEN ET AL., 2014), the findings of this study suggest that modularization may lead to cost savings, supporting findings of prior studies (BOHMER, 2005; EISSENS-VAN DER LAAN ET AL., 2016; MEYER ET AL., 2007). The findings related to increased patient flow are similar to suggestions by prior research (VÄHÄTALO AND KALLIO, 2015). The observations of this study indicate that the enhancement of patient flow may be due to the streamlining of communication between different phases of service phases, an aspect of modularization that has been discussed before (MEYER ET AL., 2007; SOFFERS ET AL., 2014).

However, the findings of this study demonstrated that in addition to benefits, modularization challenges service production in hospital care. This research emphasized the need to enable customization of hospital services, a characteristic that was especially important with patients requiring special treatments and clinical trial patients. It is possible that both the standardization of service components and the inflexible criteria regarding patient-selection can decrease flexibility and variety in modular service

production. Although the modularization of day hospital services did not restrict customization of treatments and procedures on hospital level, the standardization of the day hospital services in the Meilahti Triangle hospital restricted day hospital service customization. These findings contradict with prior studies in an elderly care context (DE BLOK ET AL., 2010B). The findings are in line with earlier studies suggesting that health-care professionals may see modularization as restrictive to customization through standardization (VÄHÄTALO AND KALLIO, 2015) or the specification of interfaces as contradictory to their professional autonomy (VAN DER LAAN, 2015). It is also worth noting that after modularization, communication with day hospital patients regarding their overall care became less flexible during their day hospital treatment visits as the hematology outpatient clinic is responsible of communication.

The findings related to changes in resource efficiency were partly positive and partly negative and thus are in line with prior studies indicating that modularization in healthcare may reduce or increase costs (BOHMER, 2005; CHORPITA ET AL., 2005; MEYER ET AL., 2007; VÄHÄTALO AND KALLIO, 2015). When treating more patients in outpatient day hospitals, it is important to note that total cost decreases are subject to ward capacity decreases. If inpatient resources are not decreased simultaneously, although treatments are focused towards outpatient care, no real cost savings may occur.

In this study, positive changes to the bed utilization rate in hematology in HUS were found and bed count was decreased from 38 to 32. In addition, the findings indicated that outpatient personnel have been able to carry out more treatments and procedures after modularization, thus indicating that modularization of outpatient care may increase resource efficiency. However, neither the bed utilization rate nor treatment and

procedure visits/ FTE could be compared to the reference hospital because of lack of data from the reference hospital.

### Patient satisfaction and preferences

This study was the first to explore patient perspectives and satisfaction related to modularized hospital services. The findings indicated that patients may be satisfied with their overall treatment in hospital care whether or not they have a named nurse. The findings showed that oncology patients who currently have named nurses in the traditionally designed day hospital prefer named nurses and a maximum of three treating nurses more often than hematology patients treated in the modularized hospital. In addition, the findings showed that the number of treating nurses and annual visits affected preferences.

Both of the patient groups were satisfied with their treatments although they were treated in day hospitals that are designed in different ways. However, patient satisfaction and experience are affected by several different factors (BERWICK ET AL., 2017; COULTER, 2017), and thus one should note that the existence of named nurses or not is only one factor that may affect satisfaction. Nonetheless, these findings are noteworthy and interesting, because previously oncology patients have communicated the importance of having the same nurse during different visits (BERGLUND ET AL., 2015), and continuity of care has been considered important (BARNET AND SHAW, 2013; BERGENMAR ET AL., 2006; CAMPBELL ET AL., 2010).

The tasks of the named nurses in oncology in HUS are similar to tasks of nurse navigators (BERGLUND ET AL., 2015; JOHNSON, 2016). However, named nurses of HUS only participate in the treatment phase of oncology patients. As this study focused on day hospital care, not the whole patient process of oncology patients, the findings cannot be directly compared with studies focusing on nurse navigators (CASE, 2011; JOHNSON, 2016; RILEY AND RILEY, 2016).

### **Linkage of healthcare characteristics, and enablers, constraints and outcomes of modularization**

Prior healthcare modularization studies have identified healthcare characteristics such as professional autonomy, high information asymmetry, heterogeneity in patients demands, and continuous efforts to create new service and technological innovations (VAN DER LAAN, 2015; VÄHÄTALO AND KALLIO, 2015). This study focused on understanding how enabling activities may support modularization although specific service characteristics may constrict change. This is important, as there exists contradictory and inconsistent experiences of the use of operations management models in healthcare (D'ANDREAMATTEO ET AL., 2015; GROVE ET AL., 2010; SA COUTO, 2008; SHORTELL ET AL., 1995), which may be partly rationalized due to differences in implementation. A better comprehension of the enablers and constraints of modularization may help to understand in what contexts and conditions modularization may be applicable, and what factors should be taken into account in the implementation process.

Six activities that were used to design a modular service architecture in HUS and both positive and challenging outcomes of the process were identified. In addition, a synthesis of how specific characteristics of healthcare may constrain modularization, and respectively outcomes, was developed. A framework and five propositions to support the understanding of the application of modularity in a hospital context were created. The framework demonstrates how the enabling activities carried out in the design phase of hospital service modularization support modularization when inbuilt characteristics cause inertia.

Characteristics of healthcare: hierarchy, professional autonomy, the requirement to treat all in need, fragmented delivery, and

steep information asymmetry all affected the design and the outcomes of modularization in HUS, and were similar to prior findings outside HUS (VÄHÄTALO AND KALLIO, 2015; VAN DER LAAN, 2015). The findings of this study suggest that professional culture, not only political governance (VÄHÄTALO AND KALLIO, 2015), may challenge the transformation from traditional operating models towards modularization.

The study identified and described how modularization can be applied to hospital services by identifying a service phase (day hospital care), which can be decoupled from other service production phases without disturbing the overall service production. The findings of this study demonstrate how the decomposition of care process phases (EISENS-VAN DER LAAN ET AL., 2016), the division of work tasks, and focused integration through interfaces (BALDWIN AND CLARK, 1997) enabled modularization and the creation of scheduling rules and instructions of care component packaging supported the new operating model. Limiting the number of modules (CARLBORG AND KINDSTRÖM, 2014) through patient volume allowed the organization to focus on patient groups and processes to which modularization was applicable. This supported the management of heterogeneous needs (RAHIKKA ET AL., 2011).

Both positive and less favorable outcomes of modularization were identified. Standardization streamlined service production and increased replaceability of personnel within the day hospital. However, as communication between the day hospital and outpatient units was standardized to enable a smooth patient flow from the outpatient clinic to the standardized day hospital, only formal communication channels, such as a referral system, were used. This diminished unofficial communication and informal relationships between personnel members, aspects that support the management of information asymmetry between personnel groups. This finding underlined that not



only service modules, but also interfaces between service modules are flexible (BASK ET AL., 2010; BRAX, 2013) and may not benefit from an excessively controlled approach. Some of the outcome findings contradicted with essential characteristics of healthcare e.g. the standardization of interfaces challenged professional autonomy (CRUSSF ET AL., 2002) as it redistributed power relations in the hospital. The identified discordances between healthcare characteristics and the outcomes of modularization may have a role in the limited applications of modularization in hospital services. In healthcare, researchers have identified and described various operating modes with different production and business logics (LILLRANK, 2018; LILLRANK ET AL., 2010), which may also affect the applicability of modularization.

### Strengths and limitations

This study was the first to focus on day hospital modularization. As the study focused on one modularized day hospital, the Triangle Hospital of HUS, it is possible that all enablers, constraints, and outcomes of modularization in a hospital context have not been identified, and, thus, the applicability of the findings to different countries and healthcare service contexts may be limited. It is also possible that there are healthcare characteristics that may affect modularization or be linked to outcomes of the operational model that have not been taken into account in this study. However, there are other specialties, such as rheumatology, which have similar delivery logics as hematology. In addition, the findings of the mixed methods study were compared to a reference hematology unit in Oulu university hospital (*Article II*). The reference hospital gave context to hematology care and the general changes and trends (such as change towards) outpatient focused care (HÄKKINEN, 2016, 2013)) in both overall hospi-

tal care delivery and hematology service delivery.

Although personnel members from different personnel groups were interviewed, and a comparative qualitative case study and a mixed methods study were conducted to identify and analyze the outcomes and underlying enablers and constraints, it is possible that not all factors and outcomes of modularization in the case were identified. However, the comparative study between the oncology (traditional outpatient service delivery) unit and hematology (modularized) unit in HUS enabled the researchers to distinguish, which constraints and enablers were related to modularization. Nonetheless, enablers and constraints that are not only unique to modularization, but could also relate to other ways of designing healthcare delivery, may have been identified.

Nurses were instructed to give out questionnaires to all oncology and hematology patients. However, it is possible that not all patients were informed of the study. It is also possible that nurses instructed patients differently and thus patients may have been more or less eager to answer the questionnaire, depending on the nurses' instructions. Thus, although nearly 450 completed questionnaires were returned, it is possible that satisfied patients answered the questionnaire more eagerly than less satisfied patients did. It is possible that all factors affecting patient preferences in the study were not identified. The hematology questionnaires took longer to gather than oncology questionnaires (seven months vs. two months). This was due to challenges in the distribution of questionnaires to the hematology patients. Only patient reported information to assess preferences and satisfaction were used, thus the accurate diagnoses or cancer stages were not available from the electronic patient record systems. Patient preferences and satisfaction were assessed in a real-world setting. Thus, the

applicability of modularization to oncology was not evaluated, as oncology was not designed in a modular way while hematology was. In addition, patient satisfaction was measured with one question. Thus, in order to gain more in-depth understanding of satisfaction and experience in outpatient care, a focused survey should be conducted (BRÉDART ET AL., 2015).

The study has strengths in addition to limitations. This study was the first to identify and conceptualize links between healthcare characteristics and activities required to modularize service production. In addition, this study was the first to combine qualitative and quantitative outcomes data to analyze outcomes of modularization and to understand if and how modularization may support changes in hospital care delivery. Modularization was studied from a broad perspective taking into account organizational enablers and constraints, both organizational and service production outcomes, and patients were interviewed and surveyed to include a patient perspective. Mixed methods were used, and both qualitative and quantitative data were included. The thesis writer gathered and analyzed all of the data used in the study. The research team had expertise in both operations management and health services research. This study not only identified, but also aimed to understand how and why the identified enabling activities are needed in modularization and why some aspects constrain modularity. Real-world data was used throughout the study and the study had a high number of completed patient surveys. Patient preferences were assessed directly from patients and not through personnel members.

### **Future directions**

New technologies together with new treatment possibilities with simultaneously aging populations and increasing healthcare

costs challenge today's and tomorrow's healthcare. Many diseases, e.g. some cancers, have become chronic conditions. The need to improve health on population level, answering to individual patients' needs and improving the experiences of patients by simultaneously cutting costs have been identified (BERWICK ET AL., 2008). Shared decision-making has been seen as one of the most important aspects of patient-centric care (BARRY AND EDGMAN-LEVITAN, 2012). Modularization and mass customization have been seen as possible means to tackle the conundrum of increasing variety and customization while simultaneously drawing on the advantages of standardization and mass production (BERWICK, 1997; BOHMER, 2005; MCLAUGHLIN AND KALUZNY, 2000; MEYER ET AL., 2007).

Prior studies have indicated that modularization may increase (DE BLOK ET AL., 2013) or decrease (VÄHÄTALO AND KALLIO, 2015) customization in healthcare. The findings of this study support the indication that, at least in highly specialized hospital services, modularization may decrease customization and flexibility. In addition, the findings indicate that modularization may not directly increase or decrease resource efficiency. The identified outcomes related to modularization may be specific to HUS and the hematology unit, thus future research is required to gain generalizable information and to understand how modularization affects service production. In addition, the findings of this study indicate that in the case of highly specialized hospital care, patient involvement is not a requisite to modularization. More studies are needed to analyze the role and need of patient involvement in care delivery design. This is important because shared decision-making has been seen as important in patient-centric care. Prior research has indicated that modularization may decrease information asymmetry between patients and healthcare professionals (VÄHÄTALO AND KALLIO, 2015). In this study, modular-

ization decreased flexibility in patient communication. Thus, more studies are needed to analyze whether modularization affects positively or negatively patients' experiences of patient-personnel communication and how it may support or hinder shared-decision making. Future studies are also needed to gain more knowledge of the segmentation of patient groups and healthcare services, aspects required in modularized healthcare service delivery.

As this study relied on one modularized case in one university hospital in Finland, more studies are needed to test the generalizability of the results. Studies in different countries, healthcare fields, healthcare systems and patient groups are needed to gain more knowledge of the applicability and outcomes of modularization, in addition to patient experiences of the new service delivery model. Future studies are needed to gain in-depth knowledge of patient satisfaction and preferences of modularization and to increase knowledge of how different patient groups may perceive modularization. 🍷



# Conclusions

**ENABLERS SUCH AS THE CREATION** of design and scheduling rules, clear division of work tasks, and clear separation of ownership of modules and designs rules that supported modularization were identified. However, constraints related to healthcare characteristics were also present and needed to be overcome to succeed in modularizing the Triangle Hospital day hospital.

The findings of this study indicate that modularization may be an applicable method to support the change from inpatient- to outpatient-focused care in a hospital context. In addition, modularization may streamline service production and official communication between personnel, and increase replaceability among personnel. However, modularization may not increase customization or patient involvement in care delivery design and might restrict informal communication between personnel members. Modularization is not evidently a way to increase resource efficiency in all situations as it may bring both positive and negative changes to resource efficiency. As not all outcomes are merely positive, organizations should consider in which situations modularization could enhance service production. In addition, organizations need to balance the requirement of customization versus standardization in order to increase the success and applicability of the operating model.

This study indicates that when applied to the care of right patient groups, patients may be satisfied with modularized care. The findings

demonstrated that patients without named nurses in modularized day hospital care were as satisfied with overall care as patients with named nurses in traditionally organized day hospital care. However, not all patient groups may be in favor of modularization, especially if it means that patients would not have a named nurse in outpatient care.

A framework describing the relation between healthcare characteristics, design activities, and outcomes of modularization was developed. The findings indicate that healthcare characteristics may challenge modularization. However, by developing design activities that support modularization, these challenges may be overcome. Modularization may have both positive and challenging outcomes to healthcare service delivery. Altogether, more research is needed to understand when and in what situations modularization is applicable and most likely successful in developing healthcare service delivery. 🍀



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# Appendices:

## Interview outlines and questionnaires

## Patient interview outline for semi-structured interviews

**Vapaa sana:** Kuvaile potilaskokemuksesi päiväsairaala ja poliklinikka -hoitajaksosta, erityisesti kokemuksesi siitä millaista palvelua ja miten palvelut olivat järjestetty päiväsairaalassa tiputushoito tai pistoshoito -jaksolla ja poliklinikalla. Millainen kokemus sinulla oli palveluiden järjestämisen näkökulmasta (pistos- ja tiputushoitajaksi liittyvistä hoitaja- ja lääkärikäynneistä)? Pääpaino kysymyksellä on terveystieteen palveluiden järjestämisessä (esim. miten lääkäriänsä sopiminen onnistui/vaihtaminen, oliko mielestäsi käyntejä tarpeeksi etc.)

### Yleisiä kysymyksiä alkuun

- Onko/oliko hoitajaksosi ajallisesti rajattu vai onko hoitajakso jatkuva? Toisin sanoen tiedätkö kuinka kauan päiväsairaalahoitajaksosi (tiputus tai pistoshoito) kestää?
- Oliko hoidon järjestely mielestäsi toimiva? Toimivatko käytännön järjestelyt, esimerkkeinä:
  - Lääkärivastaanottojen varaaminen/ vastaanottojen aikataulusta tiedottaminen
    - Oliko käytössä sähköpostimuistutus käynneistä? Koitko sen hyväksi? Olisiko sellainen mielestäsi hyvä?
  - Yhteydenotto hoitoyksikköön tarvittaessa
    - Saiko hoitoyksikköön helposti yhteyttä? puhelimitse (virka-aikana/virka-ajan ulkopuolella), salatulla sähköpostilla, muulla tavoin
    - Miten olisit toivonut/toivoisit voivasi pitää yhteyttä?
  - Tutkimustulosten saaminen
    - Puhelimitse (virka-aikana/virka-ajan ulkopuolella), salatulla sähköpostilla, muulla tavoin
    - Miten olisit toivonut/toivoisit voivasi pitää yhteyttä?
  - Hoidon muutosten ilmoittaminen/ yhteydenpito hoitoyksikköön
  - Ohjaus sairaalassa oikeaan paikkaan käyntien yhteydessä
- Saitko tarpeeksi informaatiota koskien päiväsairaalan ja poliklinikan toimintaa? (miten varataan aikoja, ilmoittaudutaan, saadaan yhteyttä yms.) Missä muodossa sait informaatiota? Millaisessa muodossa olisit toivonut saavasi informaatiota?
- Saitko hyvin informaatiota hoidon etenemisen järjestämisestä hoidon aikana?
- Palvelu:
  - Millaisiksi olet kokenut hoitajien ja lääkäreiden palvelukyvyt? Osaavatko ammattilaiset huomioida palvelunäkökulmaa eli sitä, että potilaan ja ammattilaisen kohtaaminen on palvelutapahtuma?
  - Miten koet: uskotko, että palvelulla on merkitystä kokonaiskuvaasi hoitoyksiköstä? Onko asialla ollut vaikutusta kokemaasi laatuun? Mikäli kyllä, miten/miksi?

### Ajan varaaminen ja itseilmoittautuminen:

- Haluaisitko pystyä itse varaamaan ajan lääkärille/hoitajalle päiväsairaalaan tai poliklinikalle? Näetkö tämän asian merkityksellisenä?
- Onko aikoihin ja niiden varaamiseen pystynyt itse vaikuttamaan? Onko asia merkityksellinen?
- Onko mielestäsi hoidon vaiheella vaikutusta siihen, haluaako itse varata aikoja?
- Näetkö tarvetta itseilmoittautumisen mahdollisuudelle?
- Onko potilaana helppo kulkea/mennä oikeaan hoitopaikkaan? Ohjaavatko henkilökunta? Joutuuko menemään useampaan paikkaan?

### Pistos- ja tipushoito Päiväsairaalassa:

- Toivoisitko voivasi olla hoidon aikana ryhmähuoneessa (tai pari), vai olisiko sinulle tärkeää olisiko järjestetty yksilötalassa? Mikä olisi mielestäsi optimaalinen ryhmäkoko?
- Koitko/koetko saavasi pistos- ja tipushoidon aikana tarpeeksi kontaktia hoitajaan?
- Onko sinulla ollut tietty hoitaja koko hoidon ajan päiväsairaalassa ( eli onko sinua hoitanut yksi vai useampi hoitaja saman päivän aikana, kun olet käynyt päiväsairaalassa)? Mikäli käyt/ olet käynyt useita kertoja päiväsairaalassa pistos-/tiputushoidossa, onko sinulla ollut sama hoitaja kaikilla kerroilla vai vaihtelee hoitaja?

- Koetko saavasi yksilöllistä hoitoa/palvelua? Jos kyllä, mitkä asiat tähän vaikuttivat? Jos ei, mikä sai sinut tuntemaan näin ja olisiko jotakin muuttamalla voinut muodostua erilainen tunne?
- Omahoitaja: Onko mielestäsi sillä merkitystä onko sinua hoitava hoitaja aina sama eri tiputus- tai pistoishoitokerroilla? Onko sillä merkitystä, kuinka monta eri hoitajaa sinulla on? Mikäli omahoitajaa ei ole mahdollista järjestää, kuinka montaa eri hoitajaa pidät vielä kohtuullisena määränä?

#### Poliklinikkakäynteihin liittyviä kysymyksiä:

- Oletko käynyt tiputus- tai pistoishoitojen yhteydessä tai hoitojakson aikana lääkärin tai hoitajan vastaanotolla?
- Mikäli olet käynyt vastaanotolla, onko hoitaja tai lääkäri pysynyt samana vai onko vastaanottaja vaihtunut?
- Mikäli vastaanottaja on vaihtunut, kuinka monta eri vastaanottajaa sinulla on ollut ja onko sinulla ollut eri vastaanottaja joka kerralla? Onko asia mielestäsi tärkeä sen kannalta, kuinka laadukkaaksi koet saamasi hoidon?

#### Sekalaisia:

- Eri hoidon vaiheet
  - Onko vaiheita (esim. tutkimustulosten saaminen), jotka liittyvät päiväsairaalaan, joita tahtoisit itse hoitaa (esimerkiksi tarkistaa tulokset internetistä, mikäli nykyään tarvitsee soittaa?)
  - Oletko sitä mieltä, että tarvitaan kontakti henkilön kanssa tutkimustulosten saamista varten?
    - Mikäli mielestäsi lääkäri tai hoitajan vastaanotto on paras tapa saada tietoa tutkimustuloksista tai hoidon kulusta, näkisitkö hoitajan vai lääkärin olevan parempi henkilö informoimaan sinua?
  - Onko tilanteita, jolloin kokisit hoitajan olevan lääkäriä parempi taho antamaan sinulle informaatiota esimerkiksi tutkimustuloksista, hoitojen mahdollisista haittavaikutuksista tai omista kokemuksistasi haittavaikutusten osalta?
- Toivoisitko, että päiväsairaalaan olisi infuusiohoitojen lisäksi muita palveluita tarjolla?
  - HUS:n järjestämiä tai ulkopuolisen järjestämiä?
    - Esim. kampaaja, peruukkiliike, kirjakauppa, kokonaisvaltaisia eri aloja yhdisteleviä palveluita kuten mindfulness tai muut elämäntarkastus tai stressinhallinta palvelut, oman kehon ja mielen kokonaisuuden hahmottamia palveluita, psykologipalveluita (myös yksityiset), kirjasto, ravitsemusneuvoja, hieroja
  - Mikäli ulkopuolisen tahon järjestämiä palveluita olisi saatavilla, millaiset palvelut olisivat mielestäsi tarpeellisia tai hyviä? Olisiko jotain palveluita, joita et missään nimessä haluaisi päiväsairaalan ja poliklinikan yhteyteen?
- Voisitko kuvitella osan hoidon kulkuun, sairauteen, sairauden kulkuun, hoitojen aiheuttamiin haittavaikutuksiin liittyvän informaation antamista ryhmäkäynteinä/potilasryhmäkäyntinä?
  - Millaisia asioita mielestäsi voitaisiin hoitaa ryhmäkäynneillä? (Esim. liittyen pistos- tai tiputushoitoihin, infotilaisuudet sairaudesta)
  - Miten koet ryhmäkäynnit? Mahdollisuus tutustua muihin sairastuneisiin/ vertaistuki. Toivotko ettei sinun tarvitsisi jakaa asioita muiden kanssa?
- Sisältyykö hoitojakso sellaisia asioita/vaiheita tai palveluita, joita voisit itse mieluusti toteuttaa? (Esimerkiksi kyselyiden täyttäminen kotona, ravitsemukseen tai liikuntaan liittyvien tietoisuuksien kuunteleminen tai katsominen internetin avulla, muut)

### Kyselylomake veritauteja sairastaville potilaille

Tämän tutkimuksen tarkoituksena on lisätä tietoa, miten hoito voitaisiin järjestää mahdollisimman potilasystävällisesti. Tämä kyselytutkimus on suunnattu veritauteja sairastaville potilaille, jotka käyvät hoidoissa ja vastaanotoilla Meilahden Kolmiosairaalassa.

#### Kyselyn vastausohjeet:

Ensimmäisessä osassa kysytään taustakysymyksiä. Toisen osa kysymykset liittyvät hoito- ja tutkimuskäynteihin Kolmiosairaan päiväsairaalassa. Kolmannen osan kysymykset liittyvät Kolmiosairaan hematologian poliklinikan lääkärin ja hoitajan vastaanottokäynteihin. Kyselyn viimeisessä osassa kysytään yleisiä kysymyksiä liittyen sähköisiin palveluihin.

Kyselyyn vastaaminen on vapaaehtoista ja kyselyyn vastataan nimettömänä. Ellei toisin mainita, rastittakaa oikea vaihtoehto tai kirjoittakaa vastauksenne sille varattuun tilaan.

#### OSA 1: TAUSTAKYSYMYKSET

1. Sukupuoli
  - Nainen
  - Mies
  
2. Ikä
  - 18-24
  - 25-34
  - 35-44
  - 45-54
  - 55-64
  - 65-74
  - 75-84
  - 85-
  
3. Merkitkää rasti sen verisairauden kohdalle, jonka vuoksi olette hoidossa. Mikäli sairautenne ei ole listassa, pyydämme valitsemaan vaihtoehdon muu ja kirjoittamaan sairautenne nimen sille varattuun tilaan.
  - Essentiaalinen trombosytomia
  - Idiopaattinen tai immunologinen trombosytopenia (ITP)
  - Monoklonaalinen gammapatia (MGUS)
  - Myelodysplastinen oireyhtymä
  - Myelofibroosi
  - Myelooma
  - Akuutti lymfaattinen leukemia (ALL)
  - Akuutti myeloinen leukemia (AML)
  - Krooninen lymfaattinen leukemia (KLL)
  - Krooninen myeloinen leukemia (KML)
  - Lymfooma eli imusolmukesyöpä
  - Polysytomia vera
  - Talassemia tai sirppisoluanemia

- Waldenströmin makroglobulinemia
- Von Willebrandin tauti
- Hemofilia
- Muu vuototaipumus
- Tukostaipumus (mukaan lukien PNH eli Kohtauksittainen yöllinen hemoglobiinivirtsaisuus)
- Muu hematologinen sairaus (kirjoittakaa sairaus alla olevaan tilaan)

- 
- Oletteko kantasolujen siirtopotilas? Merkitkää rasti teitä parhaiten kuvaavaan vaihtoehtoon.
    - Minulle on jo tehty kantasolujen siirto
    - Minulle on päätetty tehdä kantasolujen siirto, kantasoluja ei vielä ole siirretty
    - En ole kantasolujen siirtopotilas
    - En tiedä, olenko kantasolujen siirtopotilas
  - Onko teillä muita pitkäaikaisia sairauksia (veritaudin lisäksi), joihin teillä on lääkitys käytössä?
    - Kyllä, minulla on muita pitkäaikaisia sairauksia
    - Ei, minulla ei ole muita pitkäaikaisia sairauksia

## OSA 2: PÄIVÄSAIRAALAAN LIITTYVÄT KYSYMYKSET

Tämän osan kysymykset liittyvät käynteihin Kolmiosairaalan päiväsairaalaassa. Päiväsairaala on paikka, jossa käynte saamassa muun muassa suonensisäisiä tiputushoitoja ja pistoshoitoja. Tässä osassa kysymykset eivät koske Kolmiosairaalan poliklinikan vastaanottokäyntejä.

- Milloin kävitte ensimmäisen kerran hoidoissa Kolmiosairaalan päiväsairaalaassa? Jos olette aiemmin olleet päiväsairaalahoidossa verisairautenne vuoksi Meilahden alueella (ennen kuin Kolmiosairaala valmistui), kirjoittakaa se vuosi, jolloin olette ensimmäisen kerran käyneet hoidossa.

\_\_\_\_\_ (kirjoittakaa vuosiluku tähän)

- Olen tyytyväinen saamaani hoitoon päiväsairaalaassa
  - Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
- Kuinka monta kertaa olette käyneet hoidoissa Kolmiosairaalan päiväsairaalaassa viimeisen vuoden aikana?
  - 1-5
  - 6-10
  - 11-15
  - Yli 15 kertaa
- Milloin olette olleet hoidossa Kolmiosairaalan päiväsairaalaassa?
  - Olen käynyt hoidoissa pelkästään virka-aikana (ma-pe klo 7:30–15:30 välisenä aikana)
  - Olen käynyt hoidoissa pelkästään virka-ajan ulkopuolella (ma-pe klo 15:30 jälkeen)
  - Olen käynyt hoidoissa sekä virka-aikana että virka-ajan ulkopuolella
- Haluaisiin käydä hoidoissa Kolmiosairaalan päiväsairaalaassa viikonloppuisin, mikäli päiväsairaala olisi viikonloppuisin auki.
  - Kyllä, haluaisin käydä hoidoissa päiväsairaalaassa viikonloppuisin
  - Ei, en haluaisi käydä hoidoissa päiväsairaalaassa viikonloppuisin
- Oletteko itse pystyneet vaikuttamaan siihen, käyttökö hoidoissa Kolmiosairaalan päiväsairaalaassa virka-aikana vai virka-ajan ulkopuolella?

- Kyllä, olen pystynyt vaikuttamaan siihen milloin käyn hoidossa
  - En, en ole pystynyt vaikuttamaan siihen milloin käyn hoidossa
12. Minulle on tärkeää, että saisin vaikuttaa hoitajeni ajankohtaan (kellonaikaan) Kolmiosairaalan päiväsairaalassa. Merkitkää rasti mielestänne sopivimpaan vaihtoehtoon (valitkaa yksi vaihtoehto).
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
13. Kuinka moni eri hoitaja on hoitanut teitä päiväsairaalassa käydessänne viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden hoitajien lukumäärän.
- 1
  - 2
  - 3
  - 4-5
  - 6-10
  - Yli 10
14. Toivoisin, että minua hoitaisi yhteensä seuraava lukumäärä eri hoitajia päiväsairaalassa
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Enintään 6-10
  - Yli 10
  - Minua hoitavien hoitajien lukumäärällä ei ole väliä
15. Minulle olisi tärkeää, että minulla olisi päiväsairaalassa omahoitaja. Omahoitajalla tarkoitetaan sitä, että teille on nimetty päiväsairaalassa omahoitaja, joka ensisijaisesti hoitaa teitä käynneillänne ja johon voitte ottaa yhteyttä tarvittaessa.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä

### OSA 3: POLIKLINIKAN VASTAANOTTOKÄYNTEIHIN LIITTYVÄT KYSYMYKSET

Tämän osan kysymykset liittyvät käynteihin hematologian poliklinikalla Kolmiosairaalassa. Poliklinikka on paikka, jossa käynte lääkäriin ja sairaanhoitajan vastaanotolla. Tässä osassa ei kysytä Kolmiosairaalan päiväsairaalaan liittyvistä käynneistä.

16. Milloin kävitte ensimmäisen kerran vastaanotolla Kolmiosairaalan hematologian poliklinikalla? Jos olette aiemmin käyneet verisairautenne vuoksi hematologian poliklinikalla Meilahden alueella (ennen kuin Kolmiosairaala valmistui), kirjoittakaa se vuosi, jolloin olette ensimmäisen kerran käyneet poliklinikalla.

\_\_\_\_\_ (kirjoittakaa vuosiluku tähän)

17. Kuinka moni eri hoitaja on hoitanut teitä käydessänne Kolmiosairaalan hematologian poliklinikan vastaanotoilla viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden hoitajien määrän.

- 1
  - 2
  - 3
  - 4-5
  - Yli 5
18. Toivoisin, että poliklinikan vastaanotoilla minua hoitaisi yhteensä seuraava lukumäärä eri hoitajia?
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Yli 5
  - Minua hoitavien hoitajien lukumäärällä ei ole väliä
19. Minulle olisi tärkeää, että minulla on poliklinikalla omahoitaja. Omahoitajalla tarkoitetaan sitä, että poliklinikalla teille on nimetty hoitaja, jonka vastaanotoilla käynte ja johon voitte ottaa yhteyttä tarvittaessa.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
20. Kuinka monta eri lääkäriä teillä on ollut yhteensä hematologian poliklinikan vastaanotoilla käydessänne viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden lääkäreiden määrän.
- 1
  - 2
  - 3
  - 4-5
  - 6-10
  - Yli 10
21. Toivoisin, että poliklinikan vastaanottokäynneillä minua hoitaisi yhteensä seuraava lukumäärä eri lääkäreitä.
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Yli 5
  - Minua hoitavien lääkäreiden lukumäärällä ei ole väliä
22. Minulle olisi tärkeää, että minulla olisi poliklinikalla omalääkäri. Omalääkäriä tarkoitetaan sitä, että poliklinikalla teille olisi nimetty omalääkäri, jonka vastaanotolla kävisitte.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä

#### OSA 4: TULEVAISUUDEN SÄHKÖISIIN PALVELUIHIN LIITTYVÄT KYSYMYKSET

Seuraavat kysymykset liittyvät nykyisiin ja mahdollisiin tulevaisuuden sähköisiin palveluihin. Pyydämme teitä vastamaan sen perusteella, mitä ajattelette tällä hetkellä nykyisistä palveluista ja mahdollisista tulevaisuuden palveluista.

23. Minulle olisi tärkeää, että voisin itse varata aikoja päiväsairaalaan ja poliklinikan vastaanottokäynneille sähköisten palveluiden (internetissä tai älypuhelimella toimivat) avulla?
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
24. Minulle on tärkeää, ettei minun tarvitse itse huolehtia aikojeni varauksesta, vaan että hoitopaikka varaa ajat, jotka ilmoitetaan minulle kirjeitse tai muulla tavoin.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
25. Minulle olisi tärkeää saada laboratorio- ja kuvantamistutkimustulokset sähköisesti
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
26. Numeroikaa seuraavat vaihtoehdot teille tärkeysjärjestykseen sen mukaan millä tavoin haluaisitte asioida hoitoyksikön kanssa lääkäri vastaanottojen välillä. Numeroikaa vaihtoehdot seuraavasti: 1= tärkein, 2= toiseksi tärkein, 3 = kolmanneksi tärkein jne.
- Hoitajakäynnillä
  - Puhelimitse
  - Kirjeitse
  - Tietoturvallisen sähköpostin avulla
  - Omakanta-järjestelmän avulla
  - Kännykällä toimivan tietoturvallisen sovelluksen avulla
  - Internet-selaimessa toimivan tietoturvallisen sovelluksen avulla
  - Muulla tavoin, mikä: \_\_\_\_\_
27. Koetteko saavanne riittävästi tukea ja tietoa sairaudestanne hoitoyksiköstänne?
- Kyllä, saan riittävästi tukea ja tietoa sairaudestani
  - Ei, en saa riittävästi tukea ja tietoa sairaudestani
28. Numeroikaa seuraavat vaihtoehdot teille tärkeysjärjestykseen sen mukaan, mistä haluaisitte saada tukea ja tietoa sairaudestanne. Numeroikaa vaihtoehdot seuraavasti: 1= tärkein, 2= toiseksi tärkein, 3 = kolmanneksi tärkein jne.
- Lääkärin vastaanotoilla
  - Hoitajan vastaanotoilla
  - Potilasluentojen kautta, luennot olisivat avoimia luentoja sairaalalla
  - Sähköisten palveluiden, kuten internetissä olevien ohjeiden tai potilasvideoiden, kautta
  - Vertaistukiryhmien, potilastukijärjestöjen tai yhdistysten kautta
  - Muulla tavoin, mikä: \_\_\_\_\_
29. Mikäli teillä on kehitysehdotuksia tai kommentteja liittyen Kolmiosairaalan päiväsairaalaan ja/tai poliklinikkaan, pyydämme ystävällisesti kirjoittamaan toiveista tai ehdotuksista alla olevaan tilaan vapaamuotoisesti.



### Kyselylomake syöpätauteja sairastaville potilaille

Tämän tutkimuksen tarkoituksena on lisätä tietoa, miten hoito voitaisiin järjestää mahdollisimman potilasystävällisesti. Tämä kyselytutkimus on suunnattu syöpätauteja sairastaville potilaille, jotka käyvät hoidoissa ja vastaanotoilla Syöpätautien klinikalla.

#### Kyselyn vastausohjeet:

Ensimmäisessä osassa kysytään taustakysymyksiä. Toisen osa kysymykset liittyvät hoito- ja tutkimuskäynteihin Syöpätautien klinikan päiväsairaalassa (kutsutaan myös päiväosastoksi). Kolmannen osan kysymykset liittyvät Syöpätautien klinikan poliklinikan lääkärin ja hoitajan vastaanottokäynteihin. Kyselyn viimeisessä osassa kysytään yleisiä kysymyksiä liittyen sähköisiin palveluihin.

Kyselyyn vastaaminen on vapaaehtoista ja kyselyyn vastataan nimettömänä. Ellei toisin mainita, rastittakaa oikea vaihtoehto tai kirjoittakaa vastauksenne sille varattuun tilaan.

#### OSA 1: TAUSTAKYSYMYKSET

30. Sukupuoli

- Nainen
- Mies

31. Ikä

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65-74
- 75-84
- 85-

32. Onko teillä muita pitkäaikaisia sairauksia (syöpäsairauden lisäksi), joihin teillä on lääkitys käytössä?

- Kyllä, minulla on muita pitkäaikaisia sairauksia
- Ei, minulla ei ole muita pitkäaikaisia sairauksia

33. Merkitkää rasti sen sairauden kohdalle, jonka vuoksi olette Syöpätautien klinikalla hoidossa. Mikäli sairautenne ei ole listassa, valitkaa vaihtoehto muu syöpäsairaus ja kirjoittakaa sairautenne nimi sille varattuun tilaan. Mikäli sairautenne kohdalla on merkitty tarkenne, valitkaa näistä teitä parhaiten kuvaava vaihtoehto.

- Aivosyöpä
- Eturauhassyöpä
- Haimasyöpä
- Keuhkosityöpä
- Kivessyöpä
- Lymfooma eli imusolmukesyöpä
- Mahasyöpä
- Maksasyöpä
- Melanooma

- Munuaissyöpä
- Ohutsuolen syöpä
- Paksusuolen syöpä
  - i. Hoitoni ovat liitännäishoitoja
  - ii. Minua hoidetaan levinneen syövän vuoksi
  - iii. Muu
- Peräsuolen syöpä
  - i. Hoitoni ovat liitännäishoitoja
  - ii. Minua hoidetaan levinneen syövän vuoksi
  - iii. Muu
- Pään ja kaulan alueen syöpä
- Rintasyöpä
  - i. Hoitoni ovat liitännäishoitoja
  - ii. Minua hoidetaan levinneen syövän vuoksi
  - iii. Muu
- Ruokatorven syöpä
- Sappirakon syöpä
- Sarkooma
- Virtsarakon tai virtsajohtimen syöpä
- Muu syöpäsairaus (kirjoittakaa sairaus alla olevaan tilaan)

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## OSA 2: PÄIVÄSAIRAALAAN LIITTYVÄT KYSYMYKSET

Tämän osan kysymykset liittyvät käynteihin Syöpätautien klinikan päiväsairaalassa (kutsutaan myös päiväosastoksi). Päiväsairala on paikka, jossa käynte saamassa muun muassa suonensisäisiä tiputushoitoja. Tässä osassa kysymykset eivät koske Syöpätautien poliklinikan vastaanottokäyntejä.

34. Milloin kävitte ensimmäisen kerran hoidoissa Syöpätautien klinikan päiväsairaalassa?  
 \_\_\_\_\_ (kirjoittakaa vuosiluku tähän)
35. Olen tyytyväinen saamaani hoitoon päiväsairaalassa
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
36. Kuinka monta kertaa olette käyneet hoidoissa Syöpätautien klinikan päiväsairaalassa viimeisen vuoden aikana?
- 1-5
  - 6-10
  - 11-15
  - Yli 15 kertaa
37. Mikäli päiväsairala olisi auki myös virka-ajan ulkopuolella arkisin, mihin aikaan kävisitte mieluiten päiväsairaalassa hoidoissa? Merkitkää rasti mielestänne sopivimpaan vaihtoehtoon (valitkaa yksi vaihtoehto).
- Kävisin mieluiten hoidoissa virka-ajan ulkopuolella arkisin (ma-pe klo 15:30 jälkeen)
  - Kävisin mieluiten hoidoissa virka-aikana (ma-pe klo 7:30-15:30)
  - Minulle ei ole merkitystä käynkö hoidoissa virka-aikana vaiko virka-ajan ulkopuolella.
38. Tulisin mielelläni hoitoihin päiväsairaalaan arkisin aikaisin aamulla (klo 7:30-9:00)
- Kyllä, tulisin mielelläni
  - En, en tulisi mielelläni

39. Haluaisin käydä hoidoissa Syöpätautien klinikan päiväsairaalassa viikonloppuisin, mikäli päiväsairaala olisi viikonloppuisin auki.
- Kyllä, haluaisin käydä hoidoissa päiväsairaalassa viikonloppuisin
  - Ei, en haluaisi käydä hoidoissa päiväsairaalassa viikonloppuisin
40. Minulle on tärkeää, että saisin vaikuttaa hoitajeni ajankohtaan (kellonaikaan) Syöpätautien klinikan päiväsairaalassa. Merkitkää rasti mielestänne sopivimpaan vaihtoehtoon (valitkaa yksi vaihtoehto).
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
41. Kuinka moni eri hoitaja on hoitanut teitä päiväsairaalassa käydessänne viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden hoitajien lukumäärän.
- 1
  - 2
  - 3
  - 4-5
  - 6-10
  - Yli 10
42. Toivoisin, että minua hoitaisi yhteensä seuraava lukumäärä eri hoitajia päiväsairaalassa
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Enintään 6-10
  - Yli 10
  - Minua hoitavien hoitajien lukumäärällä ei ole väliä
43. Minulle on tärkeää, että minulla on päiväsairaalassa omahoitaja. Omahoitajalla tarkoitetaan sitä, että teille on nimetty päiväsairaalassa omahoitaja, joka ensisijaisesti hoitaa teitä käynneillänne ja johon voitte ottaa yhteyttä tarvittaessa.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä

### OSA 3: SYÖPÄTAUTIEN POLIKLINIKAN VASTAANOTTOKÄYNTEIHIN LIITTYVÄT KYSYMYKSET

Tämän osan kysymykset liittyvät käynteihin Syöpätautien klinikan poliklinikalla. Poliklinikka on paikka, jossa käynte lääkäriin ja sairaanhoitajan vastaanotolla. Tässä osassa ei kysytä Syöpätautien klinikan päiväsairaalaan liittyvistä käynneistä.

44. Milloin kävitte ensimmäisen kerran vastaanotolla Syöpätautien klinikan poliklinikalla?  
 \_\_\_\_\_ (kirjoittakaa vuosiluku tähän)
45. Kuinka moni eri hoitaja on hoitanut teitä käydessänne Syöpätautien poliklinikan vastaanotoilla viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden hoitajien määrän.

- 1
- 2
- 3
- 4-5
- Yli 5

46. Toivoisin, että poliklinikan vastaanotoilla minua hoitaisi yhteensä seuraava lukumäärä eri hoitajia?
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Yli 5
  - Minua hoitavien hoitajien lukumäärällä ei ole väliä
47. Minulle olisi tärkeää, että minulla on poliklinikalla omahoitaja. Omahoitajalla tarkoitetaan sitä, että poliklinikalla teille on nimetty hoitaja, jonka vastaanotoilla käynte ja johon voitte ottaa yhteyttä tarvittaessa.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
48. Kuinka monta eri lääkäriä teillä on ollut yhteensä Syöpätautien poliklinikan vastaanotoilla käydessänne viimeisen vuoden aikana? Mikäli ette muista tarkkaa määrää, pyydämme arvioimaan teitä hoitaneiden lääkäreiden määrän.
- 1
  - 2
  - 3
  - 4-5
  - 6-10
  - Yli 10
49. Toivoisin, että poliklinikan vastaanottokäynneillä minua hoitaisi yhteensä seuraava lukumäärä eri lääkäreitä.
- Enintään 1
  - Enintään 2
  - Enintään 3
  - Enintään 4-5
  - Yli 5
  - Minua hoitavien lääkäreiden lukumäärällä ei ole väliä
50. Minulle olisi tärkeää, että minulla olisi poliklinikalla omalääkäri. Omalääkäriä tarkoitetaan sitä, että poliklinikalla teille olisi nimetty omalääkäri, jonka vastaanotolla kävisitte.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä

#### **OSA 4: TULEVAISUUDEN SÄHKÖISIIN PALVELUIHIN LIITTYVÄT KYSYMYKSET**

Seuraavat kysymykset liittyvät nykyisiin ja mahdollisiin tulevaisuuden sähköisiin palveluihin. Pyydämme teitä vastaamaan sen perusteella, mitä ajattelette tällä hetkellä nykyisistä palveluista ja mahdollisista tulevaisuuden palveluista.

51. Minulle olisi tärkeää, että voisin itse varata aikoja päiväsairaalaan ja poliklinikan vastaanottokäynneille sähköisten palveluiden (internetissä tai älypuhelimella toimivat) avulla?
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
52. Minulle on tärkeää, ettei minun tarvitse itse huolehtia aikojeni varauksesta, vaan että hoitopaikka varaa ajat, jotka ilmoitetaan minulle kirjeitse tai muulla tavoin.
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
53. Minulle olisi tärkeää saada laboratorio- ja kuvantamistutkimustulokset sähköisesti
- Täysin samaa mieltä
  - Samaa mieltä
  - Ei eri eikä samaa mieltä
  - Eri mieltä
  - Täysin eri mieltä
54. Numeroikaa seuraavat vaihtoehdot teille tärkeysjärjestykseen sen mukaan millä tavoin haluaisitte asioida hoitoyksikön kanssa lääkärivastaanottojen välillä. Numeroikaa vaihtoehdot seuraavasti: 1= tärkein, 2= toiseksi tärkein, 3 = kolmanneksi tärkein jne.
- Hoitajakäynnillä
  - Puhelimitse
  - Kirjeitse
  - Tietoturvallisen sähköpostin avulla
  - Omakanta-järjestelmän avulla
  - Kännykällä toimivan tietoturvallisen sovelluksen avulla
  - Internet-selaimessa toimivan tietoturvallisen sovelluksen avulla
  - Muulla tavoin, mikä: \_\_\_\_\_
55. Koetteko saavanne riittävästi tukea ja tietoa sairaudestanne hoitoyksiköstänne?
- Kyllä, saan riittävästi tukea ja tietoa sairaudestani
  - Ei, en saa riittävästi tukea ja tietoa sairaudestani
56. Numeroikaa seuraavat vaihtoehdot teille tärkeysjärjestykseen sen mukaan mistä haluaisitte saada tukea ja tietoa sairaudestanne. Numeroikaa vaihtoehdot seuraavasti: 1= tärkein, 2= toiseksi tärkein, 3 = kolmanneksi tärkein jne.
- Lääkärin vastaanotoilla
  - Hoitajan vastaanotoilla
  - Potilasluentojen kautta, luennot olisivat avoimia luentoja sairaalalla
  - Sähköisten palveluiden, kuten internetissä olevien ohjeiden tai potilasvideoiden, kautta
  - Vertaistukiryhmien, potilastukijärjestöjen tai yhdistysten kautta
  - Muulla tavoin, mikä: \_\_\_\_\_
57. Mikäli teillä on kehitysehdotuksia tai kommentteja liittyen Syöpätautien klinikan päiväsairaalaan ja/tai poliklinikkaan, pyydämme ystävällisesti kirjoittamaan toiveista tai ehdotuksista alla olevaan tilaan vapaamuotoisesti.

## **Ammattilaisten haastattelurunko**

*Tavoitteena on ymmärtää päiväsairaalan ja poliklinikan toiminnan yleiskuva ja ammattilaisten näkökulma reunaehdoista sekä palveluiden integroituminen toisiinsa (poliklinikka, päiväsairaala, vuodeosasto).*

*Haastattelurunko on karkea runko auttamaan puolistrukturoitujen ja osittain narratiivisten haastatteluiden läpiviemiseen. Haastatteluissa voidaan käsitellä myös rungon ulkopuolisia asioita.*

- **Lääkärikontakti**
  - Mitkä ovat asioita, jotka mielestäsi tulee hoitaa lääkärin vastaanotolla?
  - Onko nykytyössäsi asioita, jotka voitaisiin mielestäsi hoitaa toisin (puhelin/kirje)
  - Käytkö potilaan kanssa läpi infuusiohoitoon liittyviä asioita? // kuinka monta vastaanottokertaa (vo)/ aikaa tällaiseen useimmiten menee?
  - Tapaatko potilaita infuusiohoitojen yhteydessä? Onko tämä mielestäsi hyvä toimintamalli?
  - Onko sinulla mielestäsi tarpeeksi aikaa käydä läpi infuusiohoitoihin liittyviä asioita potilaiden kanssa?
  - Onko mielestäsi infuusiopotilaiden tarpeessa tavata lääkäriä eroja?
  - Voisiko mielestäsi joitakin infuusiohoitoihin liittyviä asioita siirtää lääkäriltä hoitajalla? Mikäli sellaisia on, mitä ne mielestäsi voisivat olla?
- **Hoitajakontakti:**
  - Mitkä ovat asioita, jotka mielestäsi on hyvä hoitaa hoitajan vastaanotolla?
  - Onko nykytyössäsi asioita, jotka voitaisiin mielestäsi hoitaa toisin (puhelin/kirje/lääkärin vo)
  - Käytkö potilaan kanssa läpi infuusiohoitoon liittyviä asioita? // kuinka monta vastaanottokertaa tällaiseen useimmiten menee?
  - Tapaatko potilaita infuusiohoitojen yhteydessä? Onko tämä mielestäsi hyvä toimintamalli?
  - Onko sinulla mielestäsi tarpeeksi aikaa käydä läpi infuusiohoitoihin liittyviä asioita potilaiden kanssa?
  - Onko mielestäsi infuusiopotilaiden tarpeessa tavata hoitajaa eroja?
  - Voisiko mielestäsi joitakin infuusiohoitoihin liittyviä asioita siirtää lääkäriltä hoitajalla? Mikäli sellaisia on, mitä ne mielestäsi voisivat olla?
- **Puhelinkontakti:**
  - Millaisia asioita voidaan hoitaa puhelimitse?
  - Paljonko aikaasi kuluu puhelimesta hoidettaviin asioihin työpäivän aikana
    - Voisiko näistä hoitaa mielestäsi eri tavalla kuin soittamalla?
- **Kirje**
  - Onko kirje järkevä tapa lähettää informaatiota potilaalle?
  - Kuinka paljon aikaa kirjeitse lähetettävät asiat työllistävät?
- **Sähköinen asiointi**
  - Onko sähköistä asiointia käytössä?
  - Miten sähköinen asiointi tällä hetkellä toimii?
  - Mitä palveluita on olemassa sähköisellä asiointilla?
  - Mikäli sähköinen asiointi ei toimi nyt hyvin, mitä syitä näet tälle?
  - Mikäli sähköisestä asiointista tehtäisiin sujuvampaa, olisitko valmis käyttämään sitä ja mitä toimintoja voisi mielestäsi suorittaa sähköisellä asiointilla?
- **Yleisiä**
  - Mikäli infuusiopoliklinikalla hoitajat `toteuttaisivat` hoidon, miten mielestäsi hoitajien ja lääkäreiden yhteistyötä tulisi kehittää?
  - Tulisiko lääkäreillä olla vastaanottotiloja infuusiokeskön yhteydessä taikka välittömässä läheisyydessä? Onko tällä mielestäsi merkitystä?
  - Tulisiko potilaiden hoitamista varten olla omahoitajajärjestelmä

- Mikäli omahoitajajärjestelmää (1 hoitaja/potilas) ei voida täysin taata, kuinka monen hoitajan kanssa mielestäsi potilaiden tulee maksimissaan joutua asioimaan?

### **Potilaan päiväsairaalassa tai polilla tapahtuvaan hoitoon liittyvät palvelutuotantokysymykset**

- Kuka varaa potilaalle hoitoajat ja pystyykö potilas vaikuttamaan aikoihin?
- Prosessi: mitä tapahtuu kun potilas tulee infuusio/pistoshoitoon/ poliklinikalle?
- Onko erilaisia prosesseja → ilmoittautuminen -> valmistelut päiväsairaalaan tai polikäynnille -> infuusion/pistoksen anto tai polikäynti -> seuranta -> muita käyntejä tai toimintoja saman käynnin aikana. Kuinka usein potilaalla on sekä päiväsairaala että polikäynti samana päivänä?
- Miten ilmoittautuminen on järjestetty?
  - Itseilmoittautuminen paikan päällä
  - Netti-ilmoittautuminen tai muu
- Onko potilailla paljon kysymyksiä ilmoittautumisten yhteydessä? Tarkistetaanko ilmoittautumisen yhteydessä asioita?
- Kuinka paljon infuusiohoitojen pituudet vaihtelevat? Kun vaihtelevat, onko erilaisia toimintamalleja ja vaikuttaako se ajanvaraukseen? Miten voisimme käyntitiedoista tunnistaa kuinka pitkä jokin infuusioikänti on?
- Tuleeko lääkäri käymään infuusiohoitojen yhteydessä katsomassa potilasta?
  - Onko sovittu asia vai onko enemmän lääkärikohtainen?
- Hematologian polilla, onko lääkärikäynti ja infuusiohoito käynti samassa?
- Syöpätaudeilla, onko lääkärikäynti ja hoitajakäynti samalla kerralla?
- Ovatko potilaat kommunikoineet toiveita suhteessa infuusiohoitoihin/pistoshoitoihin?
- Mitä muita toimintoja päiväsairaalassa olisi infuusio- ja pistospotilaiden lisäksi?

### **Vapaa sana liittyen poli- ja päiväsairaalaprosesseihin**

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