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Team-Based Care: Quality and Process Improvement At Närhälsan Olskroken

Master's thesis in Quality and Operations Management

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ABSTRACT

Primary care in Sweden faces a structural tension between growing patient demand and persistent physician shortages. At Närhälsan Olskroken, a centrally located primary care center in Gothenburg serving approximately 14,306 listed patients, the longstanding reliance on an individual Patient-Responsible Doctor (*Patientansvarig läkare*, PAL) model has produced fragmented care pathways, low care continuity, and a high burden of isolated clinical decision-making, particularly during mandatory six-month ST doctor hospital rotations. Three high-need patient groups, patients aged 80 and above, patients on long-term sick leave exceeding two months, and frequent visitors with four or more annual contacts, bear an unequal share of these continuity failures.

This thesis employs a research methodology integrated with the DMAICL (Define, Measure, Analyze, Improve, Control, and Learn) and PDCA (Plan, Do, Check, and Act) quality improvement frameworks to design and initiate a phased transition from the individual patient-responsible doctor model to a cross-functional, team-based care model. Data were collected from the Asynja electronic health record system and the Telia Ace telephony platform, a staff pulse survey, semi-structured interviews with the chiefs of staff of two external Närhälsan facilities, and naturalistic workflow observation. The baseline dataset identified 517 patients aged 80 and above, 177 patients on extended sick leave, and 363 frequent visitors, with contact frequency ranging from five to twenty-two annual visits.

The findings identify three interdependent structural prerequisites for a successful transition: the administrative integration of the currently siloed rehabilitation division into cross-professional clinical rounds, the reconfiguration of the Telia Ace telephony system to route incoming calls by birthdate to designated team nurses, and the standardization of follow-up documentation within Asynja to eliminate non-resilient, informal physician workarounds. Comparative interview evidence from a mature three-year team-based implementation confirms that birth-date telephony routing significantly reduces re-contact rates and wait times, while a generalized queue structure as currently used at Olskroken yields no measurable improvement in these indicators.

The proposed model centers on four cross-functional care teams, each composed of specialist physicians, ST doctors, nurses, and rehabilitation professionals, serving birth-date-allocated

patient lists. Weekly interprofessional meetings to discuss the status of patients undergoing medical checkups or treatment are being proposed to replace the current unstructured administrative meeting and form the operational core of the coordination mechanism. Although the Phase 1 pilot was ongoing at the time of writing and full longitudinal outcome data were not yet available, the study concludes that the integration of structured team-based workflows, targeted telephony routing, and standardized EHR documentation constitutes a viable and theoretically grounded response to both Olskroken's specific operational vulnerabilities and the broader national challenge of delivering sustainable, equitable primary care under conditions of constrained physician supply.

Keywords: team-based care, interprofessional collaboration, primary care, lean management, DMAICL, PDCA, care continuity, Swedish healthcare, Närhälsan, process improvement.

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1

Introduction

1.1 Background

Primary healthcare in Sweden, known as "vårdcentral" (health care), is designed to be the foundation of the healthcare system, providing comprehensive and continuous tax-funded care for residents. Primary healthcare can be said to be the main entry point for all non-emergency illnesses, which include doctors, nurses, physiotherapists, and psychologists. In recent years, primary care centers have faced mounting pressure due to an increased number of aging populations, an increase in chronic illnesses, and a growing frequency of complex conditions. To meet these demands, healthcare providers must continuously evolve their organizational structures and working methods. Within primary healthcare, healthcare providers are obligated to follow established clinical protocols, while patients are encouraged to take an active role alongside their doctors in developing personalized care plans.

At primary health care in Olskroken, a centrally located health center in Gothenburg, Sweden, the current patient roster stands at approximately 14,306 listed residents. According to the Swedish National Board of Health and Welfare's guidelines for reasonable workload (1,100 listed residents per specialist and 650 per ST doctor), the clinic's current physician staffing level of 4.62 full-time specialists and 4.5 ST (specialist in training) doctors is dimensioned for a population of roughly 8,000. This disparity between capacity and demand necessitates highly efficient, coordinated, and resource-optimized working methods.

1.2 Current State and Problem Formulation

The current primary health care in Olskroken utilizes a traditional "patient-responsible doctor" (*Patientansvarig läkare*, PAL) model, where patients are distributed to individual physicians based on their date of birth (datum). While this model aims to build individual doctor-patient relationships, it is highly vulnerable to disruptions. When a designated physician is absent due to illness, parental leave, or mandatory training, particularly the six-month hospital rotations required for ST (specialization training) doctors, it breaks the continuity of the patient care.

The patient currently experiences long wait times to talk to nurses, particularly via telephone, which increases the number of days of getting a doctor's appointment and might sometimes lead to the use of emergency rooms (ER) for non-urgent matters (*Närhälsan Olskroken*, 2025).

Care continuity is a known structural challenge in the Swedish system: despite having above-

average total physician density, Sweden has significantly fewer GPs per capita than most comparable European countries, for example, France, Germany, the Netherlands, Finland, Denmark, Australia, and Belgium (Anell, Glenngård, & Merkur, 2012), with general practitioners accounting for only one in seven physicians and a GP density of 0.6 per 1,000 population, approximately one-third below the EU average of nearly 1 per 1,000 (European Commission, 2021). Patients are frequently forced to repeat their medical histories to different nurses and substitute doctors. This fragmented workflow is highly inefficient and creates significant risks, particularly for three vulnerable patient groups:

1. Patients over 80 years old: Often presenting with complex medical histories that require long-term overview rather than isolated, reactive interventions.
2. Patients on long-term sick leave (>2 months): Vulnerable to "sick leave injury," an occurrence where patients remain on sick leave without active, coordinated medical or rehabilitative treatment due to organizational silos between medical staff and rehabilitation professionals.
3. Frequent visitors (4+ visits/year): Patients who repeatedly seek care across multiple channels (1177, phone, chat, and walk-in) because their underlying needs are not fully addressed in a single, coordinated care plan.

For the staff, this lack of continuity results in a stressful work environment. Nurses making initial telephone assessments are often forced to make complex medical triage decisions in isolation, and doctors spend excessive administrative time trying to piece together fragmented medical records.

1.3 Purpose and Aims

The purpose of this master's thesis is to design, implement, and evaluate a functional proposal for a team-based care model at Närhälsan Olskroken. By transitioning from an individual-provider focus to a collaborative, cross-functional team structure (which includes specialists, ST doctors, nurses, and rehabilitation staff), the project aims to replace fragmented care with coordinated teamwork.

The specific objectives of this project are to:

Increase care continuity: to ensure that patients consistently interact with the same care team, thereby reducing the need to repeat their medical history.

Enhance medical quality and safety: to improve adherence to clinical guidelines (e.g., reduction of unnecessary narcotic prescriptions) and ensure that patients on sick leave receive active, documented rehabilitation plans.

Improve operational efficiency: to reduce the "re-contact rate" (unnecessary repeated contacts) among frequent visitors by effectively resolving issues through coordinated team efforts and improved telephone sorting (Telia Ace).

Foster a sustainable work environment: increase interprofessional collaboration, allowing the

medical staff to share coordinates in clinical decision-making and reduce individual stress/burnout.

1.4 Scope and Implementation Strategy

To ensure a safe and measurable transition, the project utilizes a phased implementation strategy.

Phase 1: The initial implementation and evaluation will specifically target the three high-need groups identified above (patients 80+, patients on sick leave for more than two months, and frequent visitors). This allows the clinic to test new collaborative workflows such as daily cross-professional "red flag" rounds and birth-date telephony routing on the patients who stand to benefit the most from coordinated care.

Phase 2: Following a successful evaluation of the pilot phase (measuring the continuity index, visit frequency, and staff satisfaction), the team-based methodology will be scaled to encompass all age groups and the entirety of the clinic's listed population, fulfilling Närhälsan Olskroken's vision to offer equal, high-quality care to all patients.

1.5 Research Questions

To guide this investigation and achieve the stated aims, this thesis seeks to answer the following research questions:

1. What are the critical structural and workflow components required to successfully transition a primary care center from a patient-responsible doctor system to a cross-functional, team-based care model?
2. How does the implementation of a team-based care model affect care continuity and healthcare utilization (e.g., re-contact rates and active treatment plans) for high-need patient populations?
3. How does the shift to a team-based workflow influence the staff's perceived work environment, specifically regarding interprofessional collaboration, workload manageability, and support in clinical decision-making?

2

Theoretical Framework

This chapter presents the theoretical foundation for the study of team-based care, quality, and process improvement at Närhälsan Olskroken. It begins with the Swedish healthcare system and primary care, then develops the concepts of team-based care, interprofessional collaboration, quality in healthcare, lean and process optimization, capacity management, and continuous improvement as the analytical basis for the thesis.

2.1 The Swedish Healthcare System

Sweden has a universal healthcare system that is nationally regulated and locally administered. The Ministry of Health and Social Affairs is responsible for policy and regulation of the 21 regions' finances and delivering most health services, and the 290 municipalities are responsible for the care of older people and people with disabilities (Ludvigsson et al., 2025). The Health and Medical Services Act automatically covers legal residents, while emergency care is also available for citizens from the EU, EEA, and some treaty countries. Children under the age of 18 years old seeking asylum and undocumented have complete access to health services, whereas undocumented and asylum-seeking adults are mainly required to pay for their medical services (Anell, Glenngård, & Merkur, 2012).

The institutional structure is important for this study because primary care improvement does not occur in isolation. The organization of care, the distribution of responsibility, and the available resources are shaped by national regulation, regional governance, and local coordination mechanisms (Anell, Glenngård, & Merkur, 2012).

2.1.1 Role of Government and Administrative Leadership

Swedish healthcare governance is guided by three foundational ethical principles defined by Government Bill 1996/97:60, which established three fundamental ethical pillars for healthcare governance: the human value principle, ensuring equal dignity for all regardless of socioeconomic status; the principle of need and solidarity, requiring that resources be allocated based on medical necessity; and the cost-effectiveness principle, which is considered secondary to the first two when making clinical decisions. These core values are integrated into the Health and Medical Services Act (SFS 2017:30), the primary legal structure governing Swedish medicine (Ludvigsson et al. 2025). This Act requires regions and municipalities to ensure the entire population has access to high-quality, equitable, and hygienic care. Additionally, it reinforces a commitment to person-centered care by stipulating that medical planning must involve patient consultation and that no treatment be administered against an individual's will (Ludvigsson et al., 2025).

In Government Bill 1996/97:60, the human value principle, which holds that all human beings have equal entitlement to dignity regardless of their socioeconomic standing; the need and solidarity principle, which directs that individuals be prioritized according to their medical need; and the cost-effectiveness principle, which, while important, remains subordinate to the first two when choices about medical care must be made (Ludvigsson et al., 2025). These principles are operationalized through the Health and Medical Services Act (SFS 2017:30), which constitutes the central legal framework of the Swedish healthcare system and mandates that regions and municipalities provide care to the entire population while upholding high quality, hygienic practices, and equitable access. The Act further emphasizes that care must not be given against the patient's will and that healthcare planning must be conducted in consultation with the patient, reflecting a strong normative commitment to person-centered care (Ludvigsson et al., 2025).

At the national level, the Swedish Parliament (Riksdag) holds legislative power, while the Ministry of Health and Social Affairs (Socialdepartementet) holds the responsibility for health and social welfare, including both legislative frameworks and budgetary appropriations. Several national agencies operate under the Ministry with direct roles in healthcare quality, safety, and reform. The National Board of Health and Welfare (Socialstyrelsen) functions as the central advisory and regulatory body, issuing national guidelines, licensing healthcare professionals, and maintaining health registers (Ludvigsson et al., 2025). The Health and Social Care Inspectorate (IVO) oversees healthcare providers and practitioners, handling patient complaints and potential cases of malpractice, while the Public Health Agency (FOHM) promotes population health, guides infection control, and coordinates vaccination programs. The Swedish Association of Local Authorities and Regions (SALAR/SKR) serves as the collective voice of the 21 regions and 290 municipalities, negotiating with the state on their behalf and providing expertise on healthcare governance and workforce matters. (Ludvigsson et al., 2025)

Despite this decentralized structure, the national government exercises considerable steering power through earmarked grants and formal agreements with SALAR. These agreements have historically targeted areas including improved access to care, mental health investments, cancer treatment equity, reduced waiting times through the healthcare guarantee (vårdgaranti), and antibiotic stewardship (Ludvigsson et al., 2025). The governance model thus reflects a dual logic: strong national legislative and ethical frameworks providing direction and accountability, while regional and local governments retain autonomy over how care is organized, financed, and delivered within their respective contexts. This architecture has proved effective at ensuring broad population coverage and relatively equitable health outcomes, though challenges related to fragmentation, care coordination, and regional variation in resource allocation persist (Ludvigsson et al., 2025).

2.1.2 Private Healthcare in Sweden

The role of private providers in Swedish healthcare expanded significantly following the enactment of the Freedom of Choice Act (Lag om valfrihetssystem, LOV, SFS 2008:962), which took effect for primary care in 2010 (Ludvigsson et al., 2025). This legislation enables patients to freely choose among any care provider, whether public or private, that has been approved and accredited by the relevant region, thereby introducing market competition as a mechanism for improving quality and responsiveness in primary and specialist outpatient care (Ludvigsson et al., 2025). Under this framework, private providers operate on the same regulatory terms and financing conditions as their public counterparts, receiving per-capita funding from the regions adjusted for demographic and socioeconomic characteristics of their registered patient lists. As a result, approximately 46% of primary care centers in Sweden are now privately operated, with significant regional variation: Region Stockholm has the highest concentration of private primary care providers, at 71% of all centers as of 2023, while other regions maintain predominantly public provision (Ludvigsson et al., 2025).

The growth of digital healthcare since 2016, largely driven by private actors offering tax-financed video and chat consultations, has further expanded the private sector's footprint in primary care delivery (Ludvigsson et al., 2025). This digital expansion has also enabled private providers to serve patients beyond their registered region, introducing a new dimension of geographic flexibility into the Swedish system (Ludvigsson et al., 2025).

Voluntary health insurance (VHI) remains highly marginal in Sweden, representing only 0.6% of total healthcare expenditure in 2022 (Ludvigsson et al., 2025). Over 90% of VHI plans are employer-financed group schemes, primarily providing supplementary coverage for expedited access to private providers, and their uptake has been concentrated among higher socioeconomic groups (Ludvigsson et al., 2025). Because of the negative implications for horizontal equity, the principle that care access should not be influenced by income, education, or background, VHI is tightly regulated in terms of which services and providers it may cover. As of 2010, Närhälsan

itself underwent a structural transformation in which some facilities were separated into private ownership financed by the region, while others remained under public operation financed by taxpayer funding, reflecting the broader trajectory of Sweden's mixed public-private primary care landscape (Ludvigsson et al., 2025).

2.1.3 Primary healthcare in Sweden

Primary care is the usual first point of contact in Sweden, even though there is no strict rule on the way it should be done. Patients are registered at a primary healthcare center based on their residential address and the availability of nearby facilities. Team-based primary care is described as the main model of practice, typically involving general practitioners, nurses, midwives, physiotherapists, and psychologists (Anell, Glenngård, & Merkur, 2012).

Primary care centers are paid through a mix of capitation, volume-based care, and smaller performance-related payments connected to quality targets such as care coordination and adherence to evidence-based guidelines. (Anell, Glenngård, & Merkur, 2012). In addition, the Commonwealth Fund notes that many regions adjust resource allocation according to morbidity and socioeconomic need, which is intended to reduce risk selection and strengthen equity in access. This financing and delivery context makes Swedish primary care especially relevant for studying how team-based care and process improvement interact with quality and capacity management (Anell, Glenngård, & Merkur, 2012).

2.2 Team-based Care

Modern healthcare systems, particularly at the primary care level, have increasingly moved away from siloed, single-provider models toward team-based approaches that draw on the complementary expertise of diverse professionals (Ludvigsson et al., 2025). This shift is driven by the growing burden of chronic illness, demographic aging, and the recognition that the complex needs of patients with multimorbidity cannot be adequately managed by any single clinician working in isolation (Ludvigsson et al., 2025). In Sweden, the team-based character of primary care is both explicit and structural: primary care centers typically employ between 40 and 50 staff members, encompassing general practitioners, nurses of various specializations, physiotherapists, assistant nurses, and administrative personnel. The national healthcare reform initiative "good quality, local healthcare" (god och nära vård), launched in 2018, further reinforces team-based care as the organizational ideal for the Swedish health system, emphasizing coordination, co-creation, and continuity of care across professional and organizational boundaries (Ludvigsson et al., 2025).

Team-based care is not merely a staffing configuration; it represents a relational and organizational culture in which professionals from different backgrounds share goals, communicate regularly and take responsibility for patient outcomes together. At its most effective, team-based primary care

integrates clinical tasks (diagnosis, treatment, monitoring) with preventive, rehabilitative, and social care activities, distributing these functions according to professional competence rather than historical convention. The alignment of this approach with lean principles is evident: team-based care reduces the fragmentation and duplication of effort that constitute major sources of waste in healthcare processes, particularly when clear role definitions and shared communication protocols are in place. (Morales et al., 2020).

2.2.1 The Medical Workforce Team

In operations management and primary healthcare systems, the configuration and deployment of human capital directly determine the capacity, service quality, and resilience of the process flow (Kollberg et al., 2007; Womack & Jones, 1996). At Närhälsan Olskroken, the clinical workforce consists of a tiered, multi-professional team: Patient-Responsible Doctors (Patientansvarig läkare, PAL), General Practitioners (GPs), Specialization Training (ST) Doctors, District Nurses (distriktssköterskor), and Assistant Nurses (undersköterskor) (Närhälsan Olskroken, 2025).

The structural foundation of Swedish primary care has historically rested on the concept of the Patient-Responsible Doctor, a model legally reinforced by the Patient Safety Act (SFS 2010:659) to safeguard clinical accountability and maintain care continuity (Ludvigsson et al., 2025). At Närhälsan Olskroken, patients are assigned to patient-responsible doctors based strictly on their date of birth (Närhälsan Olskroken, 2025). The theoretical objective of this deterministic mapping is to establish a strong, longitudinal relationship between a specific practitioner and the patient. In a stable operational environment, this direct link reduces diagnostic uncertainty and improves patient satisfaction.

The medical capacity of Närhälsan Olskroken is split between fully certified specialists and resident physicians, requiring careful coordination to prevent operational bottlenecks. Fully certified GPs (specialist i allmänmedicin) represent the senior medical tier within the clinic. At Närhälsan Olskroken, the senior physician staffing level stands at 4.62 full-time equivalents (FTEs) (Närhälsan Olskroken, 2025).

Under the Swedish National Board of Health and Welfare's (Socialstyrelsen) guidelines, a reasonable workload is defined as 1,100 listed residents per GP specialist (Ludvigsson et al., 2025). In the team-based care model, senior GPs transition from isolated practitioners into strategic team leads. They provide expert diagnostic oversight, approve complex care pathways, and serve as the clinical anchors for the cross-functional team, directly supporting nurses in clinical decision-making (Dellafiore et al., 2025).

While ST doctors provide vital clinical capacity, their training structure introduces two critical operational challenges, which are mentorship overhead and mandatory hospital rotations. ST doctors are in a learning phase and require regular, asynchronous consulting sessions with senior

GPs to approve complex assessments, which traditionally consume valuable, scheduled patient contact slots for both doctors. To complete their specialty portfolios, ST doctors must leave the primary care center for mandatory, six-month clinical rotations in specialized hospital departments (Närhälsan Olskroken, 2025). Under the legacy PAL model, these prolonged six-month absences completely sever the continuity of care for thousands of listed patients.

The nursing staff represents the primary operational interface of the clinic, managing inbound triage, basic diagnostics, and chronic disease clinics. District nurses are registered nurses with advanced, postgraduate qualifications in public health and primary care operations (Anell, Glenngård, & Merkur, 2012). They represent a highly specialized clinical workforce layer that manages the front-end of the clinic's value stream. District nurses run dedicated, independent specialty clinics within the primary health care center, including asthma, chronic obstructive pulmonary disease COPD, diabetes, and hypertension clinics, operating at their maximum professional scope to offload routine management from physicians. They operate the Telia ACE telephone routing workspace, conducting complex clinical assessments and determining whether a patient can be managed with self-care, routed to a nurse-led clinic, or pulled into a doctor's schedule (Martin et al., 2024).

Assistant nurses provide critical operational support, facilitating patient throughput and managing basic diagnostics. Their role is engineered to optimize the clinical workspace, for example, laboratory and diagnostic capture and pre-visit preparation. Managing blood sampling, ECG capture, wound dressing, and basic physiological measurements (Västra Götalandsregionen, 2026). Preparing clinical exam rooms and ensuring that diagnostic inputs are captured and recorded in Asynja before the patient consults with a GP or ST doctor, minimizing the physician's non-value-added administrative time.

2.2.2 The Operational Integration of Asynja

In high-performance service operations, the configuration of the information systems infrastructure determines an organization's capability to execute standardized work, reduce process variation, and maintain structural continuity (Kollberg et al., 2007; Womack & Jones, 1996). At Närhälsan Olskroken, the core database and clinical workspace for all patient-facing workflows is governed by Asynja, a comprehensive electronic health record (EHR) and clinical information service platform widely deployed across the Västra Götaland Region (Västra Götalandsregionen, VGR) to manage both public and accredited private primary care facilities (Västra Götalandsregionen, 2026).

From an operations management perspective, Asynja acts as the central information repository where clinical and administrative workflows converge. It transforms raw clinical interactions into standardized, trackable data points, directly facilitating the elimination of informational waste (muda) and supporting interprofessional coordination.

Asynja is not an isolated, single-function application; rather, it is structured as an integrated clinical portal composed of several specialized, interoperable digital components designed to manage different phases of the clinical value stream. The TakeCare Journaling engine is a core module that provides the clinical interface for medical documentation, diagnostic logging, and patient histories. It enforces standardized data-entry templates, ensuring that clinical records are consistent, legible, and compliant with national regulatory frameworks.

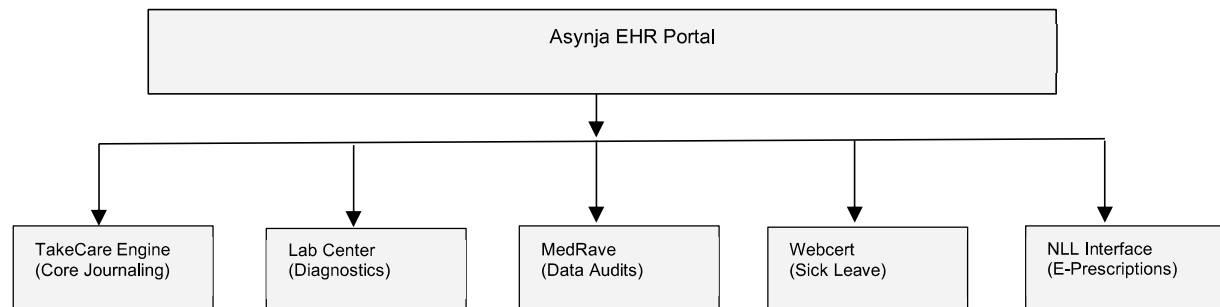


Figure 2.1: Asynja configuration and workflow

LabCenter and Diagnostic Ordering are integrated laboratory information systems (LIS) that manage the ordering and digital reporting of clinical diagnostics. It allows physicians and nurses to electronically request laboratory workups, track specimen status, and view results directly within the patient’s active profile, minimizing the lead times associated with physical paper transfers (Västra Götalandsregionen, 2026).

The National Medication List (Nationella läkemedelslistan, NLL) is deeply integrated into the Asynja prescribing module. The NLL interface, synchronized with national pharmacy databases, provides real-time, cross-organizational visibility of a patient’s active prescriptions (Västra Götalandsregionen, 2026). This interface operates as a clinical safety net, automatically cross-referencing newly prescribed treatments against a patient’s current medications to prevent pharmaceutical duplication or dangerous drug interactions.

WebCert integration is for patients navigating temporary or long-term occupational disability. Asynja integrates with Inera's Webcert platform. This module allows physicians to electronically draft, sign, and submit medical certificates (läkarintyg) directly to the Swedish Social Insurance Agency (Försäkringskassan), converting a complex administrative process into a highly standardized, digital workflow (Västra Götalandsregionen, 2026).

2.2.3 The Operational Integration of Telia ACE

In the architecture of service operations management, the design of the inbound logistics layer dictates the velocity, routing accuracy, and long-term efficiency of the entire downstream service delivery stream (Morales-Contreras et al., 2020). At Närhälsan Olskroken, this front-end interface

is governed by Telia ACE (Advanced Communication Experience), a cloud-based, omni-channel contact center platform deployed across the Västra Götaland Region to manage primary care accessibility and regulate inbound patient demand (Närhälsan Olskroken, 2025). Within the conceptual frameworks of healthcare and quality management, Telia ACE is not merely a telephone-answering utility; it functions as the critical gatekeeper of the clinic's capacity, transforming uncoordinated, high-volume patient requests into a highly structured, visible, and predictable workflow.

Telia ACE is not merely a telephone answering utility; it functions as the critical gatekeeper of the clinic's capacity, transforming uncoordinated, high-volume patient requests into a highly structured, visible, and predictable workflow. The clinic's Telia ACE configuration was characterized by a flat, uncoordinated process design that lacked specialized routing intelligence, directly contributing to clinical waste (Muda), process unevenness (Mura), and staff overburden (Muri) (Pieńkowski, 2014).

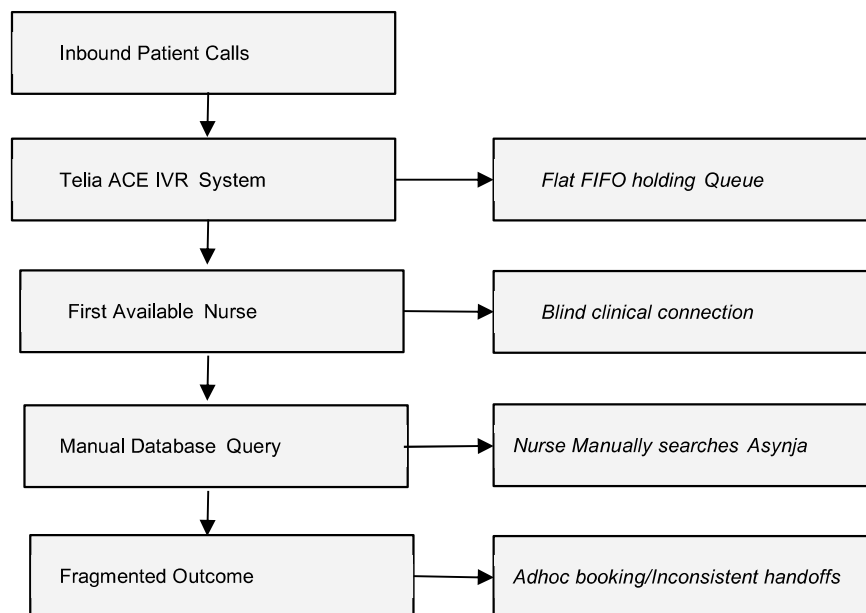


Figure 2.2: Telia ACE configuration and workflow

The interactive voice response (IVR) engine of Telia ACE operated as a basic, linear holding gate. All incoming patient calls were funneled into a single, massive, centralized First-In, First-Out (FIFO) digital queue. No database matching, birth-date partitioning, or clinical segmentation occurred at the system level. Because the platform did not prompt callers for demographic or unique identifying information, the inbound queue remained completely blind to the clinical complexity or historical tracking of the calling patient (Närhälsan Olskroken, 2025).

Under this uncoordinated queue structure, calls were automatically distributed to whichever triage nurse became available first across the entire clinic. This operational configuration resulted in

Upon answering, the nurse was forced to spend valuable, non-value-added time manually requesting the patient's Swedish personal identification number (personnummer), searching for their profile inside Asynja, and reading through chronological, unstructured medical records to reconstruct their clinical trajectory.

Pauskopplad		04:28:33	Aktivera		1. Mina ärenden		Logga ut		Men									
Väntelistor																		
Visa filteringsalternativ																		
Antal kontakter: 33 av 33								Sortera efter: Högst prioritet överst										
VIP VC Ols			Idag 13:24	Kommentar	Handlagts antal g...	Från handläggare												
VaccTid VC Ols			Idag 10:59	Kommentar	Handlagts antal g...	Från handläggare												
Recept VC Ols			Idag 11:08	Kommentar	Handlagts antal g...	Från handläggare												
VaccTid VC Ols			Idag 11:30	Kommentar	Handlagts antal g...	Från handläggare												
Recept VC Ols			Idag 12:02	Kommentar	Handlagts antal g...	Från handläggare												
Recept VC Ols			Idag 12:12	Kommentar	Handlagts antal g...	Från handläggare												
Recept VC Ols			Idag 12:17	Kommentar	Handlagts antal g...	Från handläggare												
VaccTid VC Ols			Idag 13:02	Kommentar	Handlagts antal g...	Från handläggare												
Sektid VC Ols			Idag 13:06	Kommentar	Handlagts antal g...	Från handläggare												
VaccTid VC Ols			Idag 13:28	Kommentar	Handlagts antal g...	Från handläggare												
RådTid VC Ols			Idag 13:38	Kommentar	Antal inget svar	Antal upplaget	Antal telefonsvar...	Idag 10:57	Sv	Senast uppringd Senaste återkopp...								
RådTid VC Ols			Idag 13:38	Kommentar	Antal inget svar	Antal upplaget	Antal telefonsvar...	Idag 11:00	Sv	Senast uppringd Senaste återkopp...								
RådTid VC Ols			Idag 13:46	Kommentar	Antal inget svar	Antal upplaget	Antal telefonsvar...	Idag 11:09	Sv	Senast uppringd Senaste återkopp...								
RådTid VC Ols			Idag 13:46	Kommentar	Antal inget svar	Antal upplaget	Antal telefonsvar...	Idag 11:19	Sv	Senast uppringd Senaste återkopp...								

2.2.4 The Operational Integration of the 1177 Platform

Within a healthcare framework, 1177 acts as a powerful digital filter that sorts and triages patient flows before they physically reach primary health care. This virtual architecture enables the clinic to transition from a highly reactive, uncoordinated operational stance to a structured, pull-based system of care.

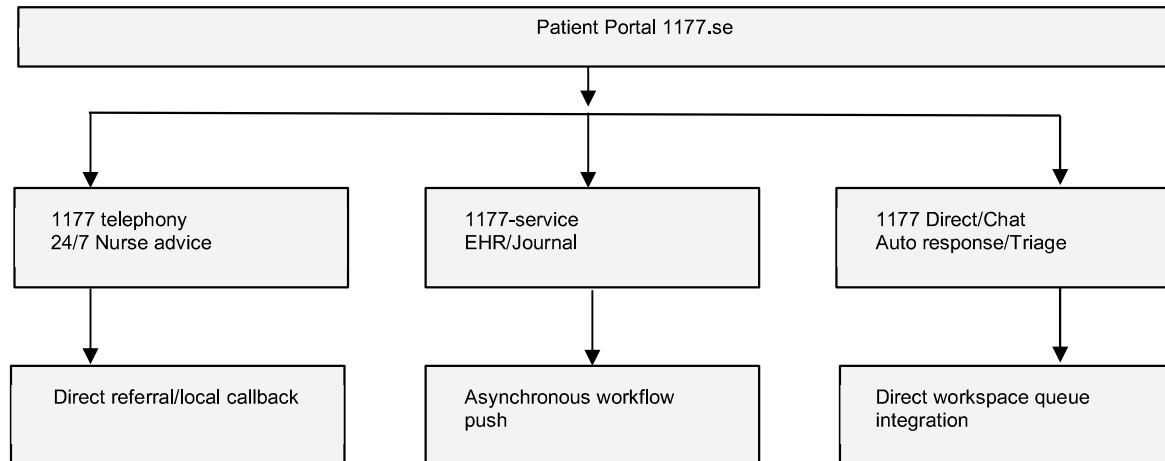


Figure 2.4: 1177 configuration and workflow

The central web portal 1177.se serves as a secure, patient-accessible platform requiring authentication via a national electronic identity system (BankID) to protect sensitive data in accordance with General Data Protection Regulation (GDPR) standards (Pohl et al., 2024). Once authenticated, patients can access Journal, Sweden’s national patient-accessible electronic health record (PAEHR) (Hägglund & Scandurra, 2022). This interface allows patients to directly view their personal health records, clinical journal notes, laboratory results, and historical medication regimes, transforming the traditional patient-provider dynamic into an active, transparent partnership (Hägglund & Scandurra, 2022; Kjörk et al., 2022).

The 1177 telephony triage network operates as a 24/7 telephone consultation service; the central 1177 telephony channel allows citizens to obtain real-time medical guidance from registered nurses (Martin et al., 2024). Nurses on the 1177 telephone service assess patient needs using a standardized, national clinical decision support system (Martin et al., 2024). This protocol-driven assessment categorizes the urgency of care and provides structured self-care instructions or directly routes the patient to their registered primary care clinic during standard operating hours.

To optimize front-end clinical capacity, Swedish primary health care has widely adopted 1177 Direct, an advanced eHealth application that integrates auto-anamnesis (automated medical history taking) and auto-triage (automated patient prioritization) with an online chat interface. When accessing this service, patients answer automatically generated clinical questions regarding their symptoms before connecting with a nurse. This digital pre-visit tool reduces initial consultation times, allows clinicians to prioritize cases based on medical urgency, and supports an efficient, asynchronous communication channel between the patient and the care team.

1177

E-tjänster personalverktyg

 Kristina Lindén Eriksson



Startsida

Närhälsan Olskroken vårdcentral, Göteborg

Översikt

Mottagningens ärenden

Mina ärenden

Skicka ärende

Listningsönskemål

Invånare

Vårdpersonal

Inställningar

Registrera synpunkter och klagomål

Ärendetyper

Mallar för invånarärenden

Logguppföljning

Hjälpe och manualer

Support

Nationellt medicinskt informationssystem

Mottagningens ärenden

Att hantera

Tilldelade

Inväntar svar

Hanterade

Avslutade

Alla

Här visas ej tilldelade ärenden och ärenden vars handläggningstid löpt ut.

FILTRERA

Uppdaterat	Ärendetyp	Skapat	Personnummer	Invånare	Status	Hanterare
2026-04-27 13:19	Skicka meddelande	2026-04-27 13:19			Inkommet	
2026-04-27 13:14	Skicka meddelande	2026-04-27 13:14			Inkommet	
2026-04-27 13:13	Förnya recept	2026-04-27 13:13			Inkommet	
2026-04-27 13:10	Förnya recept	2026-04-27 13:10			Inkommet	
2026-04-27 13:01	Skicka meddelande	2026-04-27 13:01			Inkommet	
2026-04-27 12:58	Förnya recept	2026-04-27 12:58			Inkommet	
2026-04-27 12:50	Kontakt för bokning av tid	2026-04-27 12:50			Inkommet	
2026-04-27 12:11	Skicka meddelande	2026-04-27 12:11			Inkommet	
2026-04-27 11:59	Förnya recept	2026-04-27 11:59			Inkommet	
2026-04-27 11:50	Kontakt för bokning av tid	2026-04-27 11:50			Inkommet	
2026-04-27 11:49	Skicka meddelande	2026-04-27 11:49			Inkommet	
2026-04-27 11:33	Skicka meddelande	2026-04-27 11:33			Inkommet	
2026-04-27 11:32	Skicka meddelande	2026-04-27 11:32			Inkommet	
2026-04-27 11:25	Skicka meddelande	2026-04-27 11:25			Inkommet	
2026-04-27 11:19	Skicka meddelande	2026-04-27 11:19			Inkommet	
2026-04-27 11:05	Skicka meddelande	2026-04-27 11:05			Inkommet	
2026-04-27 10:55	Kontakt för avboka eller omboka tid	2026-04-27 10:55			Inkommet	

Figure 2.5: Närhälsan Olskroken 1177 Interface

2.3 Interprofessional Collaboration in Primary Care

Interprofessional collaboration (IPC) in primary healthcare is formally defined as the process by which multiple health professionals from different disciplinary backgrounds collaborate with patients, families, and communities to deliver the highest quality care through shared decision-making and coordinated practice. The theoretical framework proposed by Reeves et al. (2010) conceptualizes IPC as a dynamic process shaped by the interplay of relational factors, including trust, communication, and mutual respect, and organizational factors such as structural alignment, shared governance, and leadership support. Within this model, collaboration develops through progressive stages, from initial role clarification and relationship building toward integrated, co-constructed care routines that become embedded in the culture and operations of the care setting. (Dellafiore et al., 2025)

In the primary care context, general practitioners (GPs) and nurses (including family and community nurses, specialist nurses, and district nurses) represent the most critical collaborative dyad. GPs traditionally act as gatekeepers, bearing primary responsibility for diagnosis, treatment, and referral, while nurses increasingly embody a proactive, population-oriented role encompassing chronic disease management, health promotion, and community engagement. Their collaboration is widely recognized as essential to effective primary healthcare: effective GP–nurse partnerships are associated with improved patient outcomes, greater continuity of care, and enhanced responsiveness to the needs of socially complex and multimorbid populations, who particularly benefit from coordinated, multidisciplinary input. At the professional level, collaboration has also

been linked to greater job satisfaction, stronger role identity, and reduced professional isolation among both GPs and nurses. (Dellafiore et al., 2025)

Despite these benefits, the operationalization of IPC remains challenging. Persistent barriers include unclear role description, tensions related to professional identity and hierarchical traditions, fragmented organizational cultures that impede shared decision-making, and communication that is frequently informal and episodic rather than structured and continuous (Dellafiore et al., 2025). These obstacles lead to duplication of tasks, underutilization of nursing expertise, and missed opportunities for coordinated care. Enabling factors, such as shared goals, regular team meetings, joint care planning sessions, protected time for collaboration, and shared documentation platforms, facilitate the development of reliable collaborative routines and strengthen professional relationships. Qualitative findings from Italian primary care settings carried out by Dellafiore et al. (2025) confirm that aligning relational, organizational, and structural dimensions is essential for sustainable, health-promoting care models: tailored training, protected time, and shared physical or digital spaces are critical for fostering effective teamwork and ensuring continuity of care in chronic illness management.

2.3.1 Quality in Healthcare Systems

Quality in healthcare is a multidimensional concept that encompasses the safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity of health services delivered across a population. In Sweden, the normative and regulatory framework for healthcare quality is anchored in the patient safety act (SFS 2010:659), which assigns healthcare providers direct responsibility for protecting patients from adverse events and healthcare-related harm (Ludvigsson et al., 2025). The National Board of Health and Welfare (Socialstyrelsen) plays a central role in setting national standards and guidelines, disseminating evidence-based knowledge, and conducting open comparisons (öppna jämförelser) of quality performance across regions and hospitals. Sweden performs well on a number of international quality benchmarks, including very high 30-day survival rates after acute myocardial infarction, exceptionally low cancer mortality, and one of the world's lowest infant mortality rates, outcomes that reflect decades of investment in universal coverage, preventive care, and evidence-based clinical practice (Ludvigsson et al., 2025).

However, quality in Swedish healthcare is not without challenges. Patient participation in care decisions remains below the average of comparable countries, with approximately 64% of Swedish patients reporting involvement in primary care decisions in comparison to 79% in similar countries, and approximately 60% show insufficient consultation time with their physicians (Ludvigsson et al., 2025). Moreover, younger patients, those with lower educational backgrounds, and those from foreign-born populations report less person-centered care and lower overall satisfaction (Ludvigsson et al., 2025). These equity dimensions underscore that quality is not uniformly distributed across the population and that structural and interpersonal factors, not only clinical protocols, determine the actual experience of care (Ludvigsson et al., 2025).

Quality improvement methodologies have become increasingly central to addressing these gaps. Systematic review evidence confirms that lean implementation in hospital and primary care settings produces significant quality improvements, including lower 30-day unplanned readmission rates, enhanced patient safety, better timeliness of care, and more appropriate use of medical imaging and diagnostic resources (Wang et al., 2025). At the process level, the identification and elimination of waste, particularly defects, overprocessing, and delay, directly translates into higher quality, as standardized, error-proofed, and streamlined processes reduce the frequency of clinical and administrative errors (Wang et al., 2025). Quality improvement in primary care must therefore be understood as both a clinical and an operational endeavor, requiring the integration of patient experience, clinical outcome data, and process performance metrics within a shared framework of continuous learning and adaptation (Wang et al., 2025).

2.4 Lean and Process Optimization

Lean management is a systematic methodology for organizational improvement derived from the Toyota Production System (TPS), developed in the Japanese automotive industry during the 1950s under the leadership of Taiichi Ohno. The term "lean" was introduced into the management literature by Womack, Jones, and Roos (1990) in *The Machine That Changed the World* and subsequently refined by Womack and Jones (1996) in *Lean Thinking*, which articulated five core principles: identifying value from the customer's perspective, mapping the value stream, creating flow, establishing pull, and pursuing perfection through continuous improvement. At its core, lean is about doing more with less, ensuring that every activity in a process contributes value from the patient's perspective while non-value-adding activities are systematically minimized or eliminated. Lean management has gained popularity in healthcare due to its explicit focus on eliminating waste, optimizing processes, and enhancing patient value. (Morales-Contreras et al. 2020)

The transfer of lean principles from manufacturing to healthcare began in earnest in the mid-1990s in the United States and expanded significantly in the 2000s, with the Virginia Mason Medical Center becoming a prominent early adopter in 2002. By the early 2020s, lean had been applied in hospitals across Europe, Asia, Latin America, and beyond, in departments ranging from emergency medicine and surgical theaters to pharmacies, clinical laboratories, and primary care. A national US survey found that 70% of hospitals had adopted lean or related methodologies to address quality and cost challenges. In Sweden specifically, research by Kollberg et al. (2007) was among the earliest to confirm that continuous improvement techniques significantly improve the performance of processes and services in Swedish health systems. Within primary care facilities such as those operated by Närhälsan, lean process optimization offers a structured approach to examining patient flow, appointment management, staff coordination, and the sequencing of clinical activities, all of which represent significant opportunities for improved efficiency and patient experience. (Morales-Contreras et al. 2020).

2.4.1 Waste Identification (Muda)

The identification and systematic elimination of waste, or "muda," is the foundational activity of lean methodology. In lean thinking, waste is often defined as any activity that does not add value from the customer's perspective, meaning an action for which the customer would not willingly pay (Pieńkowski, 2014). Pieńkowski argues, however, that treating waste only as a visible non-value-adding activity is too narrow, because it captures symptoms rather than the deeper process conditions that generate inefficiency in the first place (Pieńkowski, 2014). Pieńkowski identifies seven traditional forms of muda. These are overproduction, waiting, conveyance, overprocessing, inventory, motion, and correction (Pieńkowski, 2014).

Within the Toyota-derived understanding of waste, muda is only one part of a broader system that also includes muri (overburden or unreasonable strain) and mura (unevenness or variation). Pieńkowski explains that these three concepts are interdependent and should be analyzed together, because unevenness in workload or scheduling can create overburden, and both in turn generate visible non-value-adding activities in the process (Pieńkowski, 2014). This broader perspective is especially useful in healthcare and service operations, where delays, repeated work, unnecessary movement, and idle capacity often arise from unstable demand, poor coordination, or badly designed work standards rather than from isolated task failures alone (Pieńkowski, 2014).

"Overproduction" refers to producing earlier or in greater quantity than needed; "waiting" captures idle time caused by missing information, delayed inputs, or equipment stoppages; "conveyance" refers to unnecessary movement of materials or items between stages; "overprocessing" involves doing more work than is necessary; and "inventory" reflects excess stock that often hides other inefficiencies. "Motion" refers to unnecessary human movement, and "correction" includes inspection, rework, and defect handling (Pieńkowski, 2014).

A key contribution of Pieńkowski's analysis is that muda should not be treated only as a descriptive list of waste categories but as something that can be observed, measured, and linked to root causes. The article stresses that effective lean transformation requires complex waste identification, quantified waste metrics, and response standards so that detected waste leads to corrective action rather than remaining as passive information (Pieńkowski, 2014).

In primary care settings such as Närhälsan Olskroken, analogous forms of waste include long patient waiting times, which may appear in delayed appointments. Redundant administrative documentation, avoidable re-bookings, and underutilization of nursing staff for tasks within their professional remit. From Pieńkowski's perspective, these visible wastes should be traced back to the deeper influence of mura and muri, since sustainable improvement depends on removing not only the wasteful activity itself but also the instability and overburden that generate it (Pieńkowski, 2014).

2.4.2 Mura (Unevenness)

"Mura" refers to unevenness, irregularity, or variation in a process or conditions under which output volumes, workload distribution, or demand patterns fluctuate unpredictably over time (Pieńkowski, 2014). In a manufacturing context, mura manifests as inconsistent production rates or uneven scheduling; in healthcare, it appears as the irregular surges and troughs of patient demand across hours, days, and seasons that prevent stable staffing and resource allocation. Pieńkowski (2014) explains that mura is particularly insidious because it tends to be treated as an external given an immutable feature of demand, rather than as a condition that can itself be analyzed and partially mitigated through smarter scheduling, modular appointment systems, and proactive demand management. When mura is left unaddressed, the organization is forced into a permanent reactive mode: staff are alternately idle and overwhelmed, appointment slots are either unfilled or impossible to obtain, and clinical processes operate at the mercy of demand variation rather than according to standardized, stable workflows (Pieńkowski, 2014).

The current patient-responsible doctor model has no structural mechanism to absorb or redistribute this unevenness: all incoming calls enter a single undifferentiated queue, and triage nurses handle whichever cases arrive regardless of complexity or continuity considerations. The result is that demand variation directly translates into staff overload at peak hours and underutilization during off-peak periods, a textbook expression of how mura propagates muri (Pieńkowski, 2014). The proposed Telia Ace reconfiguration in figure 5.3, which routes calls to designated care teams by patient birth date, represents a structural response to mura: by distributing demand across teams with knowledge of their respective patients, the system converts undifferentiated queue pressure into a more predictable, team-specific workload that can be planned for and stabilized (Närhälsan Olskroken, 2025).

2.4.3 Muri (Overbudden)

"Muri" refers to overburden, the condition in which people, equipment, or processes are pushed beyond their reasonable capacity or capability, whether through excessive workload, inadequate resources, unclear task standards, or a combination of all three (Pieńkowski, 2014). Unlike muda, which describes waste that can be observed as idle time or redundant activity, muri describes strain that is experienced subjectively by staff but generates objective consequences: increased error rates, accelerated burnout, higher absenteeism, and deteriorating quality of clinical decision-making under pressure (Pieńkowski, 2014). In lean thinking, muri is not merely an HR concern; it is a process quality concern, because overburdened workers in cognitively demanding roles inevitably produce more muda in the form of defects, corrections, and omissions than colleagues operating within their optimal capacity range.

In the context of primary care, Pieńkowski's (2014) framework has direct clinical relevance. A triage nurse who handles thirty unscreened calls per morning shift, without access to a care plan

for any of the callers and without the ability to consult a physician in real time, is operating under precisely the kind of structural muri that Pieńkowski describes. The cognitive load of triage decisions, each requiring rapid assessment of urgency, medical history inference, and routing judgment, is compounded by the absence of decision support, producing conditions in which errors are not a matter of individual competence but of system design. This mirrors Pieńkowski's (2014) central argument: "Sustainable improvement cannot be achieved by asking individuals to perform better under the same structural conditions but only by redesigning the conditions themselves so that reasonable workloads and adequate information support are built into the standard work."

2.5 Process Optimization

Process optimization in lean management refers to the systematic redesign of work so that value-adding activities are preserved while waste, variation, and overburden are reduced as much as possible. In Pieńkowski's framework, effective optimization depends on more than simply spotting visible inefficiencies; it requires a structured system that combines complex waste identification, quantified metrics, and standardized responses to abnormalities so that improvement becomes continuous rather than episodic (Pieńkowski, 2014).

Pieńkowski also argues that active waste should be measured continuously through operational data, because optimization requires ongoing visibility into how the process actually performs in real time. Suggested indicators include direct labor time, standard time, available time, downtime, rework time, work-in-process, and standard work-in-process. These can be used to calculate variation in output, overload or underutilization, and several forms of muda, such as poor flow, downtime, non-productive time, inefficiency, and rework (Pieńkowski, 2014). From this perspective, process optimization is not limited to redesigning a workflow once; it involves creating a monitoring system that detects deviations early and supports timely corrective action (Pieńkowski, 2014).

Another important feature of process optimization in the article is the use of response standards. Pieńkowski emphasizes that waste data have little value if they are collected only for reporting and are not connected to structured problem-solving. For that reason, he proposes a standardized response process linked to PDCA, in which abnormal metric values trigger analysis of root causes, implementation of countermeasures, evaluation of results, and standardization of successful changes (Pieńkowski, 2014). This makes optimization a closed-loop improvement system rather than a one-time analysis exercise, and it aligns closely with lean's continuous improvement philosophy (Pieńkowski, 2014).

The article further highlights visualization as a practical support for optimization, especially through the Yamazumi chart. Pieńkowski explains that this chart can display workload distribution, reveal variation between operators, show potential overburden or underutilization, and distinguish value-adding from non-value-adding steps. In that sense, visualization helps

translate abstract waste metrics into operational insight that teams can use to rebalance work, redesign tasks, and reduce non-value-adding time more effectively (Pieńkowski, 2014).

This interpretation of process optimization is highly relevant. A healthcare process may appear inefficient because of long waiting times, repeated documentation, staff interruptions, or poor patient flow, but optimization requires examining whether those outcomes stem from weak standards, an uneven workload, missing coordination, poor layout, or a lack of response mechanisms. Pieńkowski's framework suggests that sustainable process optimization is achieved when organizations combine measurement, visualization, and standardized problem solving to remove the causes of waste rather than only its visible manifestations (Pieńkowski, 2014).

2.6 Capacity Management

Capacity management in healthcare refers to the strategic planning, allocation, and adjustment of organizational resources, including clinical staff, physical spaces, medical equipment, appointment slots, and administrative systems, to meet patient demand efficiently while maintaining the quality and safety of care. In Swedish primary care, capacity management is complicated by a persistent structural mismatch between demand and supply. There is a documented shortage of general practitioners nationally, with few primary care centers meeting the national benchmark of a maximum 1,100:1 patient-to-regular-physician (fast läkarkontakt) ratio. In 2023, Swedish primary care recorded 3,478 physical visits per 1,000 residents, reflecting substantial and growing demand that existing capacity arrangements struggle to absorb without generating delays and unmet needs. Furthermore, the funding and resource allocation for facilities such as Närhälsan Olskroken are partly determined by the number of registered patients and proximity to hospitals, introducing financial constraints that interact directly with capacity management decisions. (Ludvigsson et al., 2025)

Effective capacity management requires not only sufficient resources but also their intelligent configuration and use. Lean-informed approaches to capacity management differ from conventional approaches by first seeking to recover latent capacity through the elimination of waste rather than simply adding resources. Wang et al. (2025) confirm that lean implementation in hospitals increases patient volumes by between 15% and 65% through better use of existing resources, without requiring proportional increases in staffing or physical infrastructure. In primary care, this involves designing appointment scheduling systems that minimize no-show rates and idle time, aligning staffing patterns with predictable daily and weekly demand fluctuations, and ensuring that clinical and administrative processes do not unnecessarily consume the time and attention of highly trained staff on tasks that could be streamlined or delegated. Capacity management is thus both a resource question and a process quality question; the two are inseparable in the lean framework (Morales-Contreras et al., 2020).

2.6.1 Agile Adaptation

Agile adaptation, in the context of healthcare capacity management, refers to the ability of a care facility to dynamically reconfigure its operational arrangements in response to fluctuating patient demand, unexpected events, and changing resource availability, maintaining service quality and access throughout (Marin-Garcia, Vidal-Carreras, & Garcia-Sabater, 2021). Unlike rigid capacity planning models that assume relatively stable demand and fixed resource commitments, agile approaches deliberately build flexibility into staffing, scheduling, spatial use, and care pathway design so that the system can absorb variability without resorting to reactive crisis management (Bracci et al., 2014). This is particularly relevant in primary care settings, where demand is inherently variable across seasons, days of the week, and patient demographics, and where the consequences of capacity shortfalls, including extended waiting times, avoidable emergency department attendances, and deteriorating management of chronic conditions, are highly consequential for patient health.

In lean healthcare, operational agility is achieved through several interdependent mechanisms. Cross-training of staff to competently perform multiple roles reduces dependency on any single role or individual and allows teams to flex their configuration in response to short-term demand changes. Modular appointment systems, such as same-day access models that reserve a portion of daily capacity for urgent or unplanned visits, buffer scheduled care against unpredictable demand surges without sacrificing continuity. Visual management tools, such as capacity and demand boards displayed in clinical areas, enable real-time situational awareness for frontline teams, allowing supervisors and staff to identify emerging bottlenecks and reallocate resources before delays cascade across the system (Ludvigsson et al., 2025). In Sweden, the digital transformation of primary care, including web-based 1177 services, video consultations, and remote patient monitoring, has introduced a powerful new channel for agile demand management, enabling providers to shift patients between in-person and digital modalities based on clinical need and available capacity (Ludvigsson et al., 2025). The "god och nära vård" reform explicitly envisions this kind of flexible, digitally enabled care coordination as a structural feature of the future Swedish primary care system (Ludvigsson et al., 2025).

2.7 Continuous Improvement

Continuous improvement, captured in the Japanese concept of *Kaizen* (改善), meaning "change for the better," is the philosophical and operational commitment that undergirds the entire lean management system. Rather than treating improvement as a discrete project with a defined endpoint, the Kaizen philosophy holds that every process can always be made better and that the responsibility for identifying and acting on improvement opportunities rests with all members of the organization, from frontline clinical staff to senior management. In healthcare, this represents a significant cultural shift from traditional hierarchical and compliance-based models of quality assurance toward a model of distributed, iterative problem-solving embedded in daily work. Kollberg et al. (2007) were among the first to confirm that continuous improvement techniques significantly improve process and service performance in Swedish health settings, a finding that has since been replicated across diverse healthcare contexts internationally.

Sustaining continuous improvement in healthcare requires both structural conditions and relational enablers. At the structural level, regular process audits, real-time performance measurement systems, patient feedback mechanisms, and dedicated time for improvement activities create the infrastructure within which Kaizen can operate. At the relational level, psychological safety, the confidence that raising problems or challenging existing practices will be met with curiosity rather than defensiveness, is a prerequisite for the honest identification of waste and error. Wang et al. (2025) observe that hospitals successfully sustaining lean practices foster a collaborative culture in which staff at all levels are engaged in problem-solving and process redesign, treating each operational difficulty not as a personal failure but as information about the system that can be acted upon. For primary care facilities such as Närhälsan Olskroken, institutionalizing this culture requires deliberate leadership investment, creating regular forums for team reflection, making performance data visible and accessible to all staff, and ensuring that improvement suggestions from nursing, administrative, and clinical staff are systematically captured, evaluated, and implemented.

2.7.1 Plan-Do-Check-Act (PDCA)

The Plan-Do-Check-Act (PDCA) cycle, also referred to as the Deming or Shewhart cycle, is a four-stage iterative model for structured, evidence-based continuous improvement that forms the methodological backbone of lean management and quality systems in healthcare. In the Plan phase, a specific improvement opportunity is identified from process analysis or performance data, root causes are investigated using tools such as fishbone diagrams or 5-whys analysis, and a targeted intervention is designed with clearly defined expected outcomes and measurement criteria. The Do phase involves implementing the planned change, typically on a small scale, in a pilot unit or limited time period, while carefully documenting what was done, by whom, and under what conditions in order to enable meaningful evaluation. The Check phase then evaluates the results of the intervention against the pre-intervention baseline and the pre-specified expected outcomes,

using quantitative indicators, such as waiting times, patient volumes, length of stay, error rates, or staff satisfaction scores, to determine whether the change produced the desired effect and whether any unintended consequences arose. Finally, the Act phase involves a decision based on this evidence: successful improvements are standardized, documented in updated work protocols, and scaled across the organization or to additional departments, while unsuccessful or partially effective interventions are analyzed to extract lessons that inform the next iteration of the cycle.

Wang et al. (2025) explicitly identify PDCA as one of the core lean tools employed in hospital improvement programs, alongside value stream mapping, fishbone diagrams, poka-yoke, and visual management. Its iterative structure makes it particularly well-suited to complex adaptive systems like primary care, where interventions interact with social, organizational, and clinical dynamics in ways that are difficult to predict in advance and where learning from implementation is as valuable as the initial design. In the context of Närhälsan Olskroken, PDCA cycles can be applied to specific operational challenges, such as appointment scheduling inefficiencies, patient no-show rates, referral turnaround times, or coordination between medical and nursing staff, providing a disciplined mechanism for transforming analytical insights into sustained, measurable improvements in service quality and efficiency. Critically, the cyclical nature of PDCA ensures that improvements are never treated as permanent solutions, but as the new baseline from which the next round of improvement begins, embedding the Kaizen philosophy into the operational rhythm of the facility

2.8 The DMAIC Methodology

DMAIC, an acronym for Define, Measure, Analyze, Improve, and Control, is a structured, data-driven problem-solving framework originally developed by Motorola in 1986 as the operational backbone of Six Sigma (Kam et al., 2021). Unlike ad hoc improvement efforts, DMAIC provides a disciplined, sequential sequence of phases that guides improvement teams from the precise articulation of a problem all the way through to its sustained resolution (Melo et al., 2022). Due to its structured and iterative nature, DMAIC has since been increasingly combined with Lean principles, giving rise to the Lean Six Sigma methodology, and applied widely in healthcare settings to reduce variability, eliminate waste, and improve service quality (Kam et al., 2021; Wang et al., 2025).

The framework consists of five distinct phases. In the define phase, the problem is clearly formulated from both organizational and patient (customer) perspectives, establishing the scope, goals, and key outcome measures of the improvement project (Kam et al., 2021). In the Measure phase, the current process is broken down and explored through data collection; in outpatient settings, for example, this involves auditing patient in-clinic times and mapping process flow steps to establish a reliable baseline (Kam et al., 2021). The analysis phase involves rigorous examination of the collected data to identify the underlying root causes of inefficiencies. Tools like time-in-motion studies, the Five Whys technique, fishbone diagrams, and Value Stream

Mapping (VSM) are commonly deployed at this stage (Kam et al., 2021; Marin-Garcia et al., 2021). In the improvement phase, targeted solutions are developed, piloted, and implemented to address the root causes identified in the preceding phase (Kam et al., 2021). Finally, the control phase ensures that implemented solutions are sustained over time through monitoring plans, standardized procedures, and ongoing performance tracking (Kam et al., 2021).

A growing body of evidence confirms the effectiveness of DMAIC when applied in healthcare. Kam et al. (2021) demonstrated the full DMAIC cycle in a publicly funded, tertiary referral outpatient ophthalmology clinic in Sydney, Australia. Through a time-in-motion study and root cause analysis (Analyze phase), the authors identified that over 70% of patient in-clinic time was spent waiting, with poor scheduling and inconsistent triage processes accounting for 77% of all identified issues (Kam et al., 2021). Following the implementation of targeted, low-cost interventions in the improve phase, including schedule restructuring, dedicated postoperative clinics, standardized triage, and clearer documentation templates, the median patient in-clinic time was reduced by 18% and the number of patients seen per session increased by 9%, without any additional capital expenditure (Kam et al., 2021). This case illustrates the particular suitability of DMAIC in resource-constrained, publicly-funded healthcare environments, a context comparable to Närhälsan Olskroken.

The value of VSM as a core diagnostic tool within the Analyze phase has been confirmed by systematic reviews of its application in healthcare. Marin-Garcia et al. (2021) conducted a scoping review of VSM use in healthcare services between 2015 and 2019, finding that VSM is almost invariably deployed alongside structured improvement methodologies, examples including PDCA or DMAIC, and that it consistently functions as the starting point of any lean implementation (Marin-Garcia et al., 2021). The review further confirmed that the primary outcomes addressed by VSM in healthcare are operational in nature, particularly reductions in lead time, waiting time, and non-value-added activities, which aligns directly with the waste categories identified in the current-state analysis conducted at Närhälsan Olskroken (Marin-Garcia et al., 2021).

A 2025 systematic review by Wang et al., synthesising 60 studies across multiple countries, further substantiates DMAIC-guided Lean implementation at the hospital level. The review found that Lean, when applied through structured improvement cycles, consistently reduces waiting times (by 11% to 88% across studies), decreases length of stay, increases patient volume without additional resources, and improves 30-day readmission rates and patient safety outcomes (Wang et al., 2025). Importantly, Wang et al. (2025) also found that most Lean initiatives yielding the strongest results were deployed in large public hospitals, in departments facing high patient volume and resource pressure, and that they were characterized by a disciplined, step-by-step approach to improvement. These findings reinforce the rationale for applying a DMAIC framework at Närhälsan Olskroken, where capacity constraints, variable patient demand, and limited staffing resources present precisely the conditions for which DMAIC was designed, and

the operational necessity of the PDCA cycle arises when unforeseen circumstances disrupt the foundational research design, necessitating an agile adaptation mechanism.

Understanding the barriers and facilitators to DMAIC implementation is equally important for practical application. Melo et al. (2022), drawing on a narrative literature review of 102 studies, found that the single most commonly cited facilitator of Lean implementation in healthcare was leadership engagement and commitment, cited in 28 studies, followed by team training (26 studies) and cross-functional collaboration (23 studies). Critically, the authors also identified following a disciplined step-by-step methodology such as PDCA or DMAIC as a key facilitator in its own right, cited in 12 studies, as it provides a clear, shared framework that helps overcome resistance, establish common goals, and sustain improvements over time (Melo et al., 2022). Conversely, the primary barriers to successful DMAIC implementation included resistance to change among clinical staff (particularly physicians), siloed departmental thinking, insufficient training in Lean concepts, and a hierarchical organizational culture in which non-physician staff felt unable to contribute to improvement processes (Melo et al., 2022). These barriers must be actively anticipated and mitigated in the implementation of the team-based care model at Närhälsan Olskroken.

DMAIC provides the structured, evidence-based improvement framework that guides both the diagnostic work and the redesign activities presented in this thesis. Its five phases, define, measure, analyze, improve, and control, map directly onto the sequence of work conducted at Närhälsan Olskroken: from the initial problem formulation and VSM-based process mapping through root cause analysis and the co-design of a team-based care model to the piloting and monitoring of the new care structure. In this thesis, the framework is extended by the addition of a sixth phase, learn, reflecting the action research dimension of the project and the iterative, reflective character of knowledge generation in a primary care context (Marin-Garcia et al., 2021; Melo et al., 2022).

3

Methodology

This chapter presents the methodology chapter of this master's thesis; it begins with the research strategy and design, flows into DMAIC implementation, the data collection methods, PDCA application, and the researcher's role; states the methodology limitations; and ends with the ethical considerations.

3.1 Research Strategy and Design

This thesis employs an action research methodology integrated with the DMAICL (Define, Measure, Analyze, Improve, Control, Learn) quality improvement framework. Action research is highly suited for healthcare organizational studies, as it involves an iterative process of problem identification, intervention planning, implementation, and evaluation in a real-world setting.

By utilizing DMAICL, a framework widely adopted within the Swedish healthcare system (Västra Götalandsregionen), the project ensures that academic research is directly translated into practical operational improvements at Närhälsan Olskroken.

To comprehensively evaluate the complex dynamics of interprofessional teamwork, the study utilizes a mixed-methods approach. The quantitative component tracks objective operational metrics, while the qualitative component is underpinned by a naturalistic inquiry design (Lincoln & Guba, 1985). This approach is highly effective for investigating healthcare collaboration, as demonstrated in naturalistic qualitative studies of interprofessional primary care teams (Morgan et al., 2015). Instead of utilizing a rigid, controlled experimental setup, naturalistic inquiry studies phenomena in their natural, dynamic environments. Because teamwork and collaboration are messy and highly dependent on workplace culture, this qualitative paradigm is essential. It allows the research to capture the "lived experience" of the clinical staff as they actually go about their daily work, providing the "why" behind the quantitative data.

To establish a foundational perspective of the clinic, the following section examines the contemporary healthcare environment at Närhälsan Olskroken.

3.1.1 Fragmentation and the Patient-Responsible Doctor System

The primary vulnerability of the current patient-responsible doctor system is its lack of resilience against staff absences. When a physician is unavailable due to illness, parental leave, or the mandatory six-month hospital rotations required for ST (specialist in training) doctors, their listed patients essentially lose their primary care anchor. Consequently, patients are forced to consult substitute doctors or various nurses, necessitating the repeated recounting of complex medical histories. This lack of continuity creates significant inefficiencies: clinicians spend disproportionate amounts of time reviewing disparate medical records to understand a patient's background, reducing the time available for actual medical intervention.

3.1.2 Organizational Silos and Communication Bottlenecks

A structural analysis of the clinic reveals a strict administrative division. While physicians and nurses operate under the Primary Health Care division, physiotherapy and occupational therapy staff report to a separate Rehabilitation division. (Närhälsan Olskroken, 2025). Although the rehabilitation center is in the same building as the primary care center, they do not systematically participate in daily medical rounds, leading to a siloed approach to patient care that is particularly detrimental to patients on sick leave. Furthermore, the clinic utilizes the Telia Ace telephony system but underutilizes its sorting capabilities. Patients are generally routed to the first available nurse rather than a clinician familiar with their specific care history, exacerbating the lack of continuity.

3.2 The DMAICL Implementation

To achieve the project goals systematically, the research was structured according to the six phases of the DMAICL framework, aligning directly with the clinic's operational project schedule.

In the design phase, the core problem of low continuity and its impact on patient security and the staff work environment were defined. Utilizing stakeholder feedback and initial operational reviews stated in section 1.2. The goals of improving continuity, reducing re-contact rates, and fostering collaboration were established. At the measure phase, before implementing structural changes, a baseline measurement phase is conducted to establish current performance metrics. Data collected during this phase includes the current care continuity indices and frequency of patient contact by phone, 1177, chat, and reception for the target groups over the preceding six months. Baseline metrics for medical quality indicators, specifically narcotic prescribing rates and the presence of active long-term rehabilitation plans for sick leave. Initial staff surveys assessing the workload, stress, and collaboration levels.

During the analysis phase, the collected baseline data and current workflow maps are analyzed to identify root causes of inefficiency. This includes evaluating the limitations of the existing Telia Ace telephony routing system and examining the "silo effect" that prevents seamless collaboration

between physicians, nurses, and rehabilitation staff. The analysis focuses on why patients are frequently directed to re-contact the clinic and why care plans for complex patients lack coordination. After analyzing the root cause and implementing a successful team-based care system, the focus is to improve the following: configuration of the Telia Ace system to route incoming calls based on the patient's birth date, directing them to their designated team's nurses. Replacing ad-hoc appointment booking (e.g., paper notes, blocked calendar slots) with standardized documentation and planning in the Asynja electronic health record (EHR) system. Converting the general 13:00–14:30 (on Tuesday) administrative time into targeted, interprofessional meeting rounds focused on complex patient cases and sick leave coordination.

The control phase involves the first formal evaluation of the pilot intervention. Short-term Key Performance Indicators (KPIs) are assessed against the baselines established in the Measure phase. This includes the following: analyzing early shifts in the re-contact rate, monitoring the accuracy of the new telephony routing system, and administering a follow-up staff survey. The goal of this phase is to ensure the new team-based routines are adhered to and to correct any immediate workflow deviations. The final phase involves synthesizing the lessons learned from the pilot. Best practices are documented to facilitate the next phase of extending the team-based care model to all age groups and the entire clinic population. Furthermore, a framework is established to evaluate long-term interim goals, such as reductions in overall emergency department visits and mortality rates, which can only be accurately assessed one year post-implementation.

3.3 Data Collection and Sampling

To ensure a holistic evaluation, data are collected through a combination of system extraction and naturalistic qualitative methods. The quantitative data was extracted from Asynja (continuity indices, which are the frequency of patient visits to healthcare and the percentage of sick leave plans) and Telia Ace (call volume and re-contact rates). The qualitative data was collected by creating a short and validated pulse survey (a brief one consisting of a few questions that requires less than 2 mins to fill) with the intent of making it a 3-month check-in survey. The next survey is planned for the end of May. During analysis of the results, it will be distributed to the staff who were willing to participate voluntarily to measure the perception of workplace collaboration and the effect of workload stress on the present working system. Furthermore, semi-structured interviews are conducted with external stakeholders: the chief of Närhälsan Majorna Vårdcentral (interviewee 1, personal communication, March 9, 2026), within 45 minutes and 25 seconds, and the chief of Närhälsan Vara Vårdcentral (interviewee 2, personal communication, March 16, 2026), within an hour to gather comparative insights on the successful team-based care transactions. However, preliminary interviews have already confirmed that transitioning to team-based care is an iterative learning process; long-term success is built over time as the team actively recognizes areas for improvement and prioritizes continuous learning.

The quantitative data extracted from Asynja for the purpose of this study are classified as high-need groups.

Patient population overview

Patients aged 80+: 517 patients

Frequent visitors: 363 patients (Range: 5 to 22 visits to the doctor per year).

Frequent visitors (80+): 68 patients

Extended sick leave: 177 patients

Age distribution of sick leave	
21-30-year-old	19
31-40-year-old	47
41-50-year-old	37
51-60-year-old	43
Other age groups	31

Table 1a: Targeted age groups for sick leave patients

Age distribution of frequent visitors	
0-20-year-old	13
21-40-year-old	85
41-60-year-old	104
61-80-year-old	115
Above 80-year-old	65

Table 1b: Targeted age groups for frequent visitors

Figure 3.1, 3.2, and 3.3 shows the acquired patient data for the past 1 year at Närhälsan Olskroken

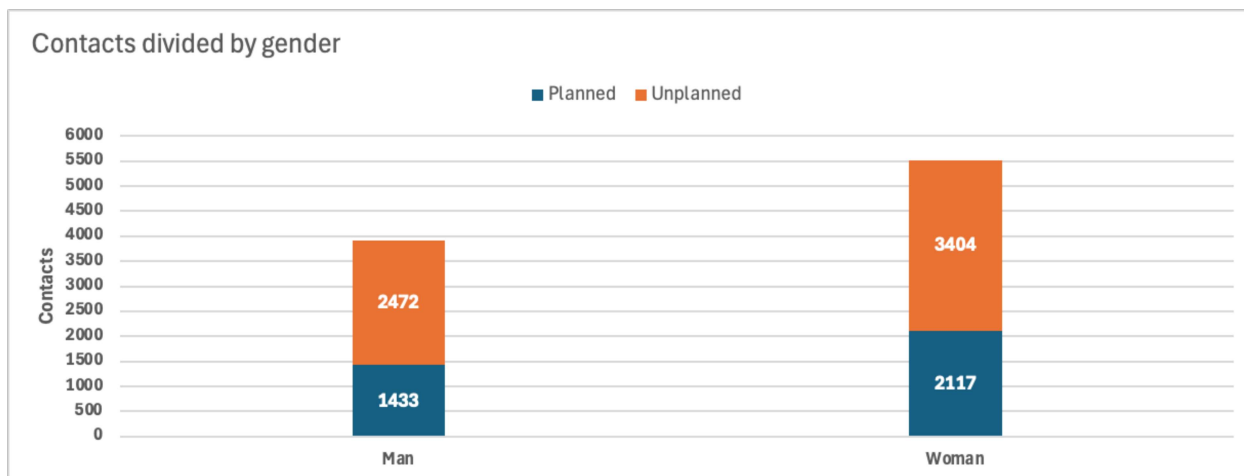


Figure 3.1: Contacts broken down by gender

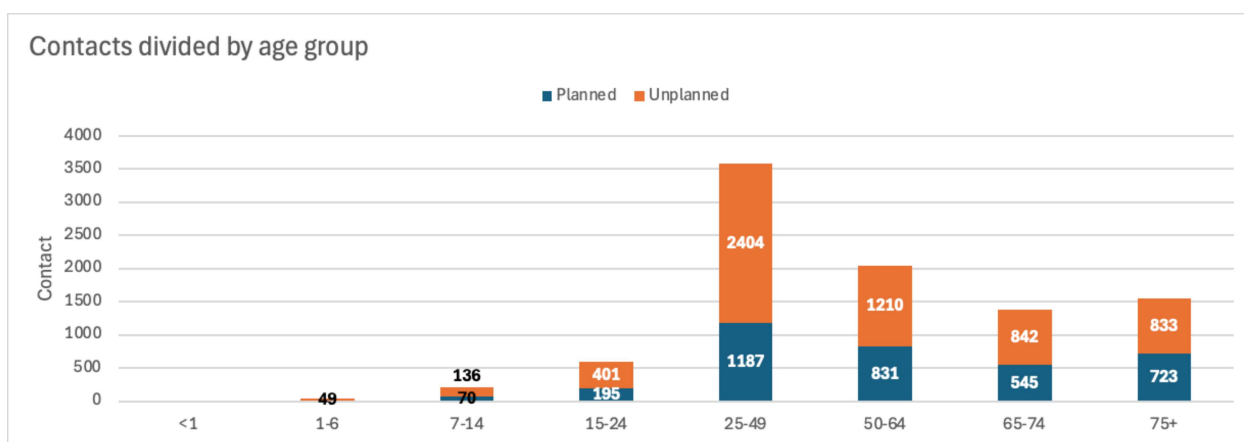


Figure 3.2: Contacts divided by Age group

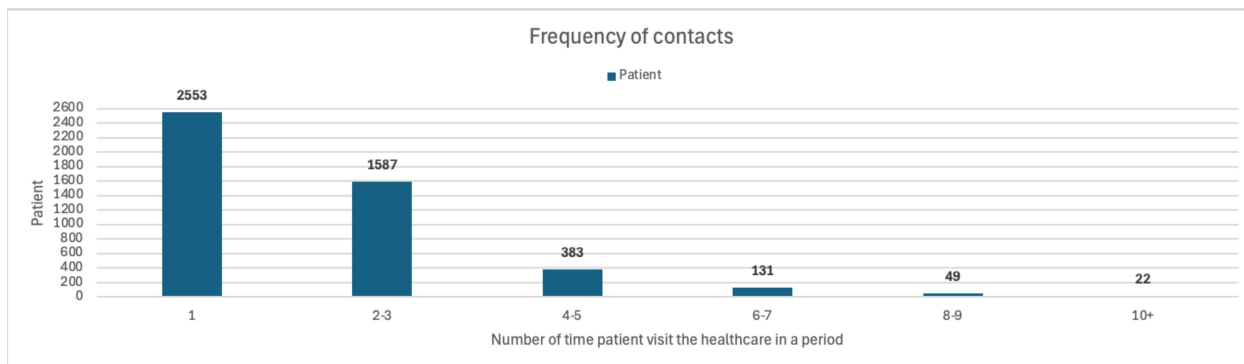


Figure 3.3: Frequency of patients' visits to Närhälsan Olskroken

3.3.1 Sampling

The allocation of patients retains the same existing structure. Patients remain assigned to teams based on the birth date associated with their officially assigned resident doctor. Teams will meet three times per week at 1:00 PM. The primary objective of these meetings is to discuss patient prognoses and finalize integrated treatment plans to ensure high-quality care and medication management.

For the communication and routing, due to limited resources, the 80+ group retains the existing dedicated direct-dial phone number for immediate access. While the other group contacts the clinic via Telia ACE and is identified by birth date. To streamline workflow, teams have implemented a color-coding system in Asynja. This allows triage nurses to instantly identify which team a patient belongs to. It should be noted that the final, comprehensive data from this sampling cannot be presented in the current scope of this thesis, as the operational experiment is still ongoing.

The triage nurse provides a call summary to the specific team. If a follow-up is required, a nurse from that designated team handles the callback; otherwise, an appointment is booked directly within the team's schedule.

For the qualitative components, a purposive sampling strategy is employed. Rather than random selection, participants are deliberately chosen to ensure maximum variation across the clinical hierarchy. This guarantees that the perspectives of specialist doctors, ST doctors, nurses, and rehabilitation staff are equally represented in the data, providing a true multiprofessional assessment.

However, preliminary interviews, corroborated by a review of the successful Svalöv team model in Region Skåne conducted during the data collection phase (Region Skåne, n.d.), have confirmed that transitioning to team-based care is an iterative learning process. As observed in the Svalöv example, long-term success is built over time as the team actively recognizes areas for improvement and prioritizes continuous learning.

3.4 PDCA Application (Where, How, and Why PDCA Came In)

While DMAIC mapped out the academic timeline, PDCA was triggered as an operational necessity when reality disrupted the original plan. When the clinic suffered severe staffing constraints (leaving us with one less doctor that resigned during the implementation), we could not rigidly stick to a static plan. We needed an agile adaptation mechanism. PDCA allowed us to run fast, iterative sprints to keep the trial phase alive and robust.

PLAN: We originally planned a multi-team deployment. When resources plummeted, we immediately replanned the workflow around resource density, pivoting from three teams to one single, high-capacity team.

DO: We launched this consolidated team model with the plan to utilize color-coding to identify the patient and route the specific birth-date cohorts directly to the specific team.

CHECK: This is where the bi-weekly meeting schedule and data audits come in. Instead of waiting until the end of the year to see if the project worked, the meetings will be used to analyze and take a pulse survey of operations. Also, to check the metrics and confirm that the data were showing promising results.

ACT: During these bi-weekly sessions, the team actively discussed ideas to be exploited. If something worked, it would be standardized immediately. If a bottleneck appears, the process will be adjusted for the following week.

Without PDCA, a sudden staff shortage would look like a failure of the research methodology. By injecting PDCA, we turned a clinical crisis into a masterclass in operations management. It proved that this research design was resilient enough to adapt to real-world resource scarcity while maintaining the validity of your data collection.

3.4.1 Transitioning from a Tri-Team Configuration to a Consolidated Single-Team Model

In the execution of action research within highly volatile clinical environments, static capacity planning frequently collides with unpredictable resource fluctuations. To maintain both operational stability and research validity under conditions of extreme resource scarcity, the project underwent a strategic process pivot.

This section details the transition from the initially designed three-team clinical structure to an optimized, consolidated single-team model, explaining the operational mechanics, capacity trade-offs, and design principles that guided this transformation.

The initial design of the team-based care model at Närhälsan Olskroken called for a tri-team configuration (Teams A, B, and C) to manage a patient group of 1125 listed residents (Närhälsan Olskroken, 2025). This planned setup was mathematically structured to divide the patient population and clinical resources into three parallel, self-contained multi-professional units, establishing scheduled sessions on Tuesdays (14:30 to 15:30) and Fridays (13:30 to 14:00) for the team to meet and discuss the patients' treatment plan.

$$\text{Patient Population Assigned to team} = \frac{\text{Patient Subgrouped Population (1125)}}{\text{Total team (3)}} = 375 \text{ patients}$$

Each team was designed to operate independently, containing its own dedicated general practitioners, specialization training (ST) resident doctors, and district-care nurses (Närhälsan Olskroken, 2025). Patients were assigned to their respective teams based on birth-date cohorts to preserve local continuity, mirroring successful Swedish primary care models such as the Svalöv tri-team implementation (Region Skåne, 2021). This segmented design aimed to create small, familiar micro-environments where patient needs could be managed by consistent staff.

Prior to the active trial execution plan, an unexpected incidence occurred; specifically, unanticipated staff resignations and extended clinical rotations compromised the nursing workforce (Närhälsan Olskroken, 2025). The clinic's available nursing pool is at a baseline capacity of 4.5 full-time equivalent (FTE) nurses to handle the entire clinic's workload.

From an operations management perspective, attempting to run the original three-team design with only 4.5 nurses would require distributing 1.5 nursing FTEs to each team:

$$\text{Nursing Capacity per Team} = \frac{4.5 \text{ Nursing FTE}}{3 \text{ Teams}} = 1.5 \text{ FTE per team}$$

Spreading 1.5 nurses across separate teams destroys operational resilience; it creates absence vulnerability. If a single nurse became absent due to illness, parental leave, or mandatory training, the affected team's nursing capacity would plummet by either 67% or 100%, causing the care cell to collapse. Process instability (Mura), front-end phone queues (Telia ACE), and electronic medical record management (Asynja) would suffer from extreme variation, creating bottlenecks and delays in clinical routing. Nurse Overburden (Muri), managing high patient volumes within isolated, understaffed cells would drive up cognitive fatigue, increase administrative waste (Muda), and trigger staff burnout (Pieńkowski, 2014; Wang et al., 2025).

Faced with this capacity bottleneck, the project applied agile adaptation and Kaizen principles to dynamically redesign the clinical workspace (Bracci & Daolio, 2014; Marin-Garcia et al., 2021). Instead of sticking to a compromised three-team plan, the clinic consolidated its available nursing resources into a single, high-capacity care unit.

By concentrating all 4.5 nursing FTEs into a single team, the clinic successfully moved from a state of fragmented scarcity to concentrated capacity. This structural concentration achieved several key operational advantages. A single team with 4.5 integrated nurses can easily absorb individual absences without halting process flow. The collective knowledge of the team covers patient cohorts seamlessly, creating a robust operational safety net.

The single team was tasked with managing the pilot birth-date cohorts (the 11th, 12th, 14th, and 15th), matching the team's available clinical capacity with a controlled, measurable patient demand stream (Närhälsan Olskroken, 2025). By housing the active targeted group in a single

team, the team eliminated the administrative handoffs and informational noise that occurs when patients are transferred across multiple, parallel team boundaries.

3.5 Combining DMAIC and PDCA

To ensure both structural academic rigor and operational resilience, this study utilizes a dual-framework approach, combining DMAIC (Define, Measure, Analyze, Improve, Control) and PDCA (Plan-Do-Check-Act). While DMAIC serves as the overarching macro-methodology dictating the linear phases of the thesis, PDCA functions as the agile micro-engine deployed within the operational environment to manage real-time clinical disruptions.

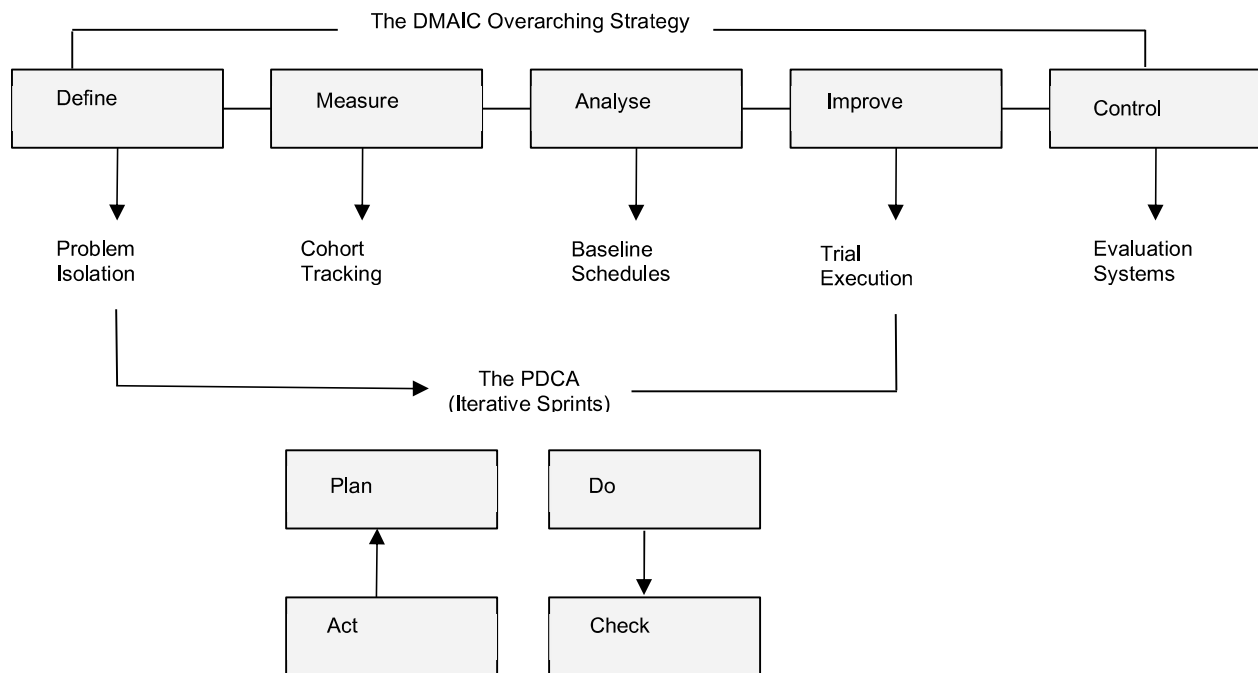


Figure 3.4: The Combined Implementation of DMAIC and PDCA

The integration of these two systems ensures that the data-driven precision of Six Sigma (DMAIC) is supported by the iterative, rapid-response feedback loops of PDCA management. This dual-layer framework allows the research design to maintain strict scientific validity while enabling the primary care facility to dynamically adapt its resources to ongoing operational challenges.

3.6 Positionality and Researcher Role

In action research, the researcher occupies a dual role as both an external academic observer and an active participant in the organizational process under study. This methodological position fundamentally differs from detached, experimental research designs in which the investigator remains separate from the subject of inquiry. At Närhälsan Olskroken, the research was conducted

in close collaboration with clinic management and clinical staff, with the researcher participating in workflow observations and contributing to the design of the team-based intervention throughout the DMAICL phases. Consistent with the action research tradition, this proximity to the organizational context is treated as an epistemological strength rather than a limitation: it enables access to tacit knowledge, informal processes, and lived professional experience that would be inaccessible through survey instruments or secondary data alone (Lincoln & Guba, 1985).

However, this embedded position also introduces the risk of researcher bias. Extended engagement with a single organizational setting can lead to normalization of its assumptions, selective attention to findings that confirm the intervention's rationale, and underweighting of contradictory evidence. To manage this risk, the following reflexive strategies were applied throughout the study. First, qualitative themes derived from staff surveys and workflow observations were properly interpreted, ensuring that findings reflect staff perspectives rather than researcher projections (Lincoln & Guba, 1985). Second, the comparative interview data from external facilities, representing both mature and early-stage team-based implementations, were deliberately included to introduce contrast and prevent the analytical frame from being anchored exclusively in Olskroken's specific context. Third, divergent findings, including instances where the proposed model encountered operational resistance or where staff responses were uncertain, are reported transparently rather than selectively omitted.

It should also be acknowledged that the researcher's affiliation with Chalmers University of Technology and the formal framing of this project as a master's thesis may have influenced how clinic staff perceived and responded to the research. Participants aware of the academic context may have provided responses that align with institutional expectations of improvement-oriented research rather than candid assessments of existing practices. This social desirability effect, common in organizational research, cannot be fully eliminated but is partially mitigated by the anonymization of all survey and interview data and by the naturalistic observation component, which captures behavioral evidence independently of self-reported attitudes.

3.7 Methodological Limitations

Several methodological limitations must be acknowledged in order to contextualize the scope and generalizability of the findings presented in this thesis.

The quantitative baseline data extracted from the Asynja electronic health record system and the Telia Ace telephony platform captures a retrospective six-month window prior to the pilot intervention. This timeframe, while sufficient to establish baseline patterns in care continuity indices, re-contact rates, and patient contact frequency, does not account for seasonal variation in demand, which is a known feature of Swedish primary healthcare. The absence of a full annual cycle of pre-intervention data means that some observed patterns may reflect seasonal rather than structural phenomena, a limitation that the planned twelve-month post-implementation follow-up is designed to address.

Sample size of the staff survey. The voluntary pulse survey administered to clinical staff yielded six responses in figure 5.1. While the limited sample reflects the practical constraints of conducting primary research within an active clinical environment, the small number of respondents restricts the statistical representativeness of the survey findings. No inferential statistical analysis has been applied to the survey data; the results are treated exclusively as indicative of staff perceptions and are interpreted in conjunction with observational and interview evidence rather than as standalone quantitative findings.

Purposive interview sampling. The semi-structured interviews were conducted with the medical leadership of two external primary care facilities: Närhälsan Majorna and Närhälsan Vara. Although these were selected to represent contrasting levels of team-based care maturity (1.5 years and 3 years of implementation, respectively), a sample of two facilities is insufficient to support broad comparative generalizations. The interview findings are therefore employed analytically to identify patterns and generate propositions about enabling conditions and barriers, rather than to establish statistically representative conclusions about Swedish primary care as a whole.

Exclusion of rehabilitation staff from baseline data collection. As detailed in Section 4.2.3, the administrative separation between the primary care division (Primärvårdsområde) and the rehabilitation division (Rehabområde) resulted in rehabilitation professionals being less systematically represented in the baseline data collection phase. The silo effect between these divisions is identified as a central structural problem; however, the asymmetric representation in the data means that the depth and operational complexity of this barrier may be understated in the current analysis.

Ongoing nature of the pilot intervention. At the time of writing, the Phase 1 pilot intervention at Närhälsan Olskroken remained in progress. As a consequence, post-intervention outcome data, including changes in continuity indices, re-contact rates, frequency of visits for target patient groups, and follow-up staff satisfaction measures, were not available for inclusion in this thesis. The findings and discussion chapters therefore draw on baseline data, comparative case evidence, and theoretical inference to project anticipated outcomes. While this approach is consistent with the exploratory and design-oriented objectives of action research, the conclusions reached regarding patient-level and staff-level effects remain prospective rather than empirically confirmed.

3.8 Research Quality

To determine the trustworthiness, credibility, consistency, and importance of these findings, the quality of this research is an important aspect for any academic study.

The quality of this research was addressed through the naturalistic qualitative methodology introduced by (Lincoln & Guba, 1985). The statistical validity is replaced by the concept of

trustworthiness, which is established through three criteria (credibility, transferability, and confirmability).

The initial findings and thematic interpretations from the baseline surveys and workflow observations are presented back to the clinical staff to verify that their lived experiences have been accurately captured. This thesis provides an extensive description of Olskroken's demographic context, staffing limitations, and organizational structure, allowing readers and management to assess how effectively these findings can be transferred to other primary care centers in the region.

This study also maintains an objective stance of acknowledging the inherent biases of evaluating a workplace in transition and ensuring that the qualitative findings are rooted directly in the participants' narratives rather than preconceived administrative assumptions.

3.9 AI Assistance

In the preparation of this thesis, AI-driven tools were applied to transcribe and translate qualitative interviews. Secondly, AI-assistance tools were employed during the drafting phase to refine linguistic clarity and improve the structural flow of the write-up. These tools aided in identifying grammatical inconsistencies and ensuring a uniform use of terminology. It is important to note, however, that the intellectual content, data interpretation, and final conclusions remain exclusively the work of the author, who critically reviewed all AI-generated suggestions to maintain academic integrity.

3.10 Ethical Consideration

The fact that this project constitutes a quality improvement initiative within a functional healthcare setting, strict adherence to patient privacy and data security is maintained. All quantitative patient data extracted from Asynja is anonymized and aggregated. The implementation of the pilot is designed to ensure that standard medical care is never compromised; rather, the intervention aims strictly to optimize the administrative and coordinative pathways of care.

Each participant was asked for permission to record, and the participant will be anonymized in the final report submitted. This approach supports each interview's integrity. GDPR (General Data Protection Regulation) will be complied with throughout the whole report with top priority. Personal data will be stored carefully in line with the laws of data privacy and protection.

4

Findings

This chapter presents the synthesized findings from the Define, Measure, and Analyze phases of the DMAICL framework. The data is derived from an analysis of national healthcare structures, internal operational mapping at Närhälsan Olskroken, qualitative staff feedback, comparative interviews with medical staff, and comparative case studies (such as the Svalöv team model). The findings are categorized into the Swedish healthcare system, internal structural bottlenecks, and insights from external best practices, which together justify the proposed transition to a team-based care model.

4.1 The Swedish Healthcare System

To understand the operational bottlenecks at Närhälsan Olskroken, it is necessary to first examine the overarching structural and historical forces shaping Swedish primary care. The foundational *Sweden: Health System Review* (Anell, Glenngård, & Merkur, 2012) and recent national data (The Commonwealth Fund, 2024) reveal several macro-level drivers impacting local clinic operations.

4.1.1 Government and Political Involvement

The Swedish healthcare system is characterized by extreme decentralization. The government mandates that Sweden's 21 regions manage primary and specialist medical care, while the 290 municipalities are responsible for social care, elderly care, and long-term care (The Commonwealth Fund, 2024). According to Anell, Glenngård, & Merkur (2012), this political division of responsibilities has historically created massive coordination gaps and systemic silos. The national struggle to integrate care across differing political and administrative boundaries directly mirrors the micro-level silos observed at Olskroken (e.g., the separation of medical and rehabilitation divisions). Furthermore, political involvement significantly reshaped primary care through the 2010 *Vårdval* (freedom of choice) reform. This legislation mandated patient choice and opened the market to private providers, essentially transforming primary care into a highly competitive environment where clinics must continuously prove their value and accessibility to patients (Anell, Glenngård, & Merkur, 2012).

4.1.2 Finance

The financial mechanisms governing Swedish healthcare directly impact clinic workflows and patient behavior. Under the *Vårdval* system, primary care funding is heavily reliant on capitation, meaning "funding follows the patient" (Anell, Glenngård, and Merkur, 2012). For Olskroken, retaining its 14,306 listed patients is not just a clinical objective but a financial imperative. If

patients experience poor continuity or long wait times, they can freely transfer their listing (and associated funding) to competing private clinics.

Simultaneously, the national financial structure inadvertently enables the frequent visitor phenomenon. Sweden utilizes a high-cost protection scheme that caps outpatient out-of-pocket spending at SEK 1,450 per year (The Commonwealth Fund, 2024). Because healthcare becomes essentially free after this low threshold, there is no financial friction to deter frequent, uncoordinated contacts. Consequently, Olskroken cannot rely on finances to rival private facilities. At the same time, the frequent visitor trend is unintentionally facilitated by the country's financial framework. Since medical care is effectively free once this minimal cap is reached, there are no economic barriers to discourage constant, disjointed clinical contacts. For this reason, Olskroken is unable to utilize financial disincentives; instead, the clinic must depend entirely on team-based collaboration and highly effective clinical triage to regulate patient demand.

4.1.3 Resources

The Swedish healthcare model has traditionally focused on hospital care, resulting in a primary care sector that is comparatively underfunded relative to other European countries. There has been a steady national effort to redirect the medical burden from costly emergency departments toward primary care centers, particularly for managing chronic conditions and the elderly population (80+).

Nevertheless, severe resource limitations, especially high staff turnover and chronic doctor shortages, heavily obstruct this objective. These workforce constraints have historically weakened the conventional patient-responsible doctor model demonstrating that it relies strictly on highly efficient clinical triage and team-based coordination to manage demand.

Historically, the Swedish system has been highly hospital-centric, leaving primary care relatively under-resourced compared to other European nations (Anell, Glenngård, and Merkur, 2012). A persistent national goal has been to shift the care burden away from expensive hospital emergency rooms and into primary care, specifically to manage the aging population (80+) and chronic diseases.

However, this goal is severely hindered by resource constraints, particularly chronic physician shortages and high turnover rates. Anell, Glenngård, and Merkur (2012) note that these workforce limitations have historically undermined the traditional "Patient-Responsible Doctor" (PAL) system, proving that the model is vulnerable on a national scale, not just locally. To compensate for these limited physician resources, national statistics show that consultations are increasingly distributed across multidisciplinary teams, with GPs handling only 30% of visits, while nurses (30%), physiotherapists (18%), and other professionals (22%) manage the rest (The Commonwealth Fund, 2024).

4.2 Internal Vulnerabilities in the Current Operating Model

The baseline analysis revealed several critical failure points within the clinic's current reliance on the patient-responsible doctor model, heavily influenced by the macro-level constraints outlined above. This is particularly problematic for the three target groups: patients 80+, individuals on long-term sick leave, and frequent visitors.

4.2.1 The Fragility of the Patient Responsible Doctor System and ST Doctor Rotations

The most significant internal finding regarding low care continuity is the structural fragility of the patient-responsible doctor system. Olskroken operates with 4.62 full-time specialists and 4.5 ST (specialist in training) doctors. While the patient-responsible doctor system theoretically assigns a specific doctor to a patient, the analysis identified that the mandatory six-month hospital rotations for ST doctors create severe disruptions. During these absences, the individual patient list is vulnerable, forcing the patients to recount their medical histories to the substitute physicians.

This local friction is reflective of the broader national design challenge. As established by Anell, Glenngård, and Merkur (2012), the patient-responsible doctor model's attempt to enforce a strict one-to-one doctor relationship relies on physician stability that simply does not exist. Furthermore, Swedish residents register with a health center as a whole, rather than a specific general practitioner (The Commonwealth Fund, 2024). The failure of the patient-responsible doctor model at Olskroken is therefore a symptom of relying on an outdated, individualistic framework in a system designed for multi-professional clinic registration.

4.2.2 Isolation in Telephone Triage

Current workflow mapping indicated that the Telia Ace telephony system is significantly underutilized regarding its sorting capabilities. Incoming calls are placed into a generalized queue, leaving triage nurses without prior contextual knowledge of the calling patient.

Qualitative feedback highlighted that this creates a highly stressful work environment where nurses make complex medical decisions in isolation. For frequent visitors (4+ visits/year) whose underlying issues are often psychosocial, this generalized triage results in temporary fixes (e.g., booking an unnecessary doctor's appointment) rather than addressing the root cause. Given the lack of financial deterrents (the high-cost protection scheme), the clinic is entirely reliant on the triage nurse's ability to efficiently manage care, a burden that is currently causing immense operational strain.

4.2.3 Administrative Silos and Long-Term Sick Leave

Mirroring the national fragmentation between regions and municipalities, Olskroken suffers from a strict administrative separation between the primary medical care division and the rehabilitation division, just like the general practice in all Närhälsan today. Figure 4.2 shows the process map illustrating the disjointed patient journey and communication breakdowns caused by administrative silos between primary health care and rehabilitation staff.

The mapping revealed that patients on sick leave (>2 months) often fall into the gap between these silos. Because physiotherapists and occupational therapists are not integrated into the daily medical rounds, medical assessments and rehabilitation occur in parallel rather than concurrently. Furthermore, the analysis uncovered unsafe, non-standardized follow-up routines among physicians, such as blocking personal calendar slots or using paper notes. If a physician is absent, these follow-ups are easily missed, directly contributing to long-term sick leave, where patients lack active, coordinated treatment plans. Overcoming these silos aligns directly with the national directives of the 2018 Care Coordination Act, which mandates unified care planning.

Figure 4.3 illustrates the disjointed patient journey for sick leave patients at Närhälsan Olskroken, highlighting three key waste points: generalized telephone triage with no patient context (orange), non-standardized follow-up documentation in personal calendars and paper notes (orange), and the delayed or missing handoff to the rehabilitation division (orange). When a physician is absent, the absence of standardized documentation results directly in missed follow-ups and sick leave injury (red).

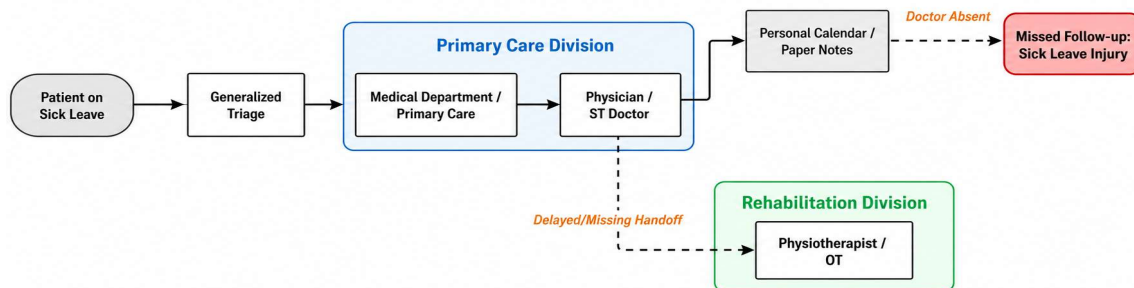


Figure 4.2: Process map illustrating the disjointed patient journey and communication breakdowns caused by administrative silos between primary health care and rehabilitation staff.

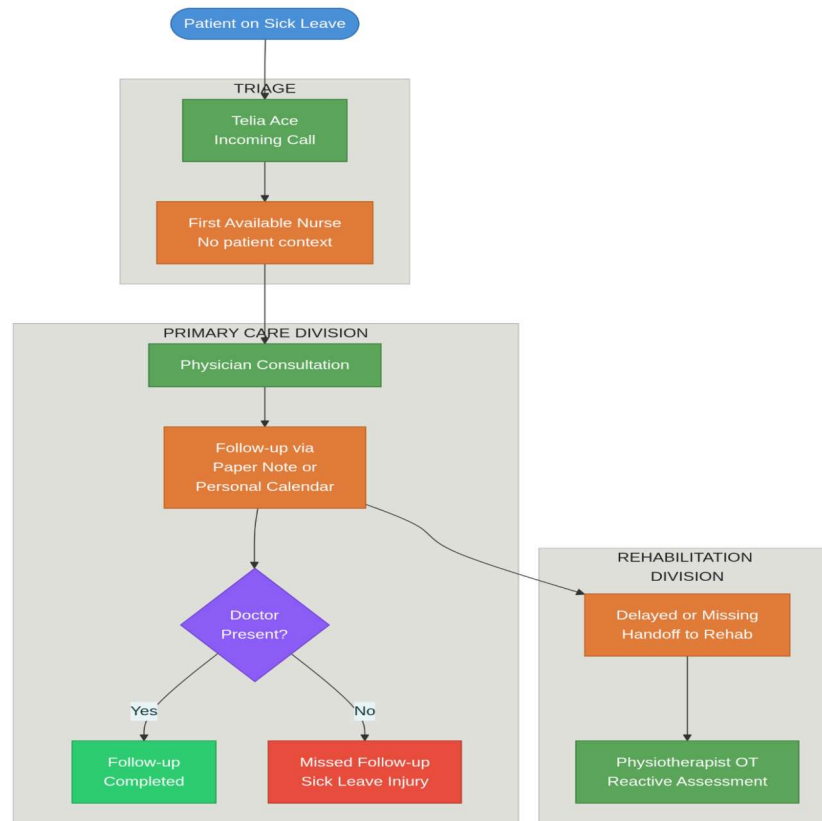


Figure 4.3: Current-state of Närhälsan Olskroken

This color logic is consistent with standard VSM notation and directly supports the *muda* analysis introduced in Section 2.3.1 (Pieńkowski, 2014).

Colour	Meaning	Lean Category
● Green	Value-adding steps	Value-added
● Orange	Waste-generating steps	Muda (waiting, correction, overprocessing)
● Red	Failure outcome	Defect / patient harm

 Purple	Decision gate	Flow control
 Blue	Patient (demand trigger)	Customer voice

Table 2: color logic indicator

4.3 Insights from External Best Practices and Interviews

To address the internal vulnerabilities, the study gathered qualitative data through interviews with the medical staff at different facilities utilizing team-based models of varying maturity (1.5-year and 3-year implementations), alongside case study reviews (Svalöv, Nuka, and Borgholm).

4.3.1 Right Competence at the Right Time and Resource Allocation

A review of the Svalöv and Borgholm models demonstrated that successful continuity means seeing the correct professional immediately. However, external interviews revealed that severe understaffing often prevents the full structural integration of rehab staff into core teams. To compensate, interviewed staff strongly suggested that team-based resources should not be utilized as a blanket solution. Instead, teams should be strictly reserved for complex, multi-morbid patients (like the 80+ demographic), while simple, acute cases should be fast-tracked to immediate appointments. This strategy maximizes the impact of limited personnel. The proposed cross-functional team structure demonstrates the interconnected roles of GPs, nurses, and rehabilitation staff working collaboratively around the patient can be seen in Figure 5.2.

4.3.2 The Effectiveness of Interprofessional Huddles

The series of interviews revealed various differences in the effectiveness of team meetings, depending entirely on their structural focus. At a highly functioning facility with a mature (3-year) team model, care teams met frequently for extended periods exclusively to brainstorm clinical treatment plans. Conversely, at a facility struggling with a newer (1.5-year) implementation, teams utilized meeting times almost entirely for administrative tasks, such as shifting patients between booking lists, with little clinical discussion.

This finding proves that merely scheduling a meeting does not yield teamwork. For Olskroken, this justifies the necessity of repurposing the generalized 13:00 administrative block into strictly clinical red flag rounds focused entirely on active patient care.

4.3.3 Technological Triage and Care Continuity

Connecting patients directly to their designated team nurses drastically reduces emergency and unnecessary visits, as seen in the Nuka System of Care. The external interviews provided empirical validation for this. In the successful 3-year implementation, strict birth-date routing was configured in the Telia ACE system, ensuring patients spoke to nurses who possessed contextual knowledge of their care plans. This resulted in drastically reduced call times, fewer re-contacts, and shorter waitlists. In contrast, the less successful implementation utilized a generalized queue and reported no visible reduction in re-contact rates. This confirms that configuring Olskroken's Telia ACE system for strict birth-date routing is a mandatory prerequisite for team-based success.

4.4 Culture and Measurability

A final qualitative finding is that transitioning to team-based care is a profound cultural shift requiring psychological safety and an iterative learning environment. Initial staff resistance can be mitigated by intentionally mixing varying performance levels and cooperative dispositions within the newly formed teams.

Furthermore, the interviews exposed a critical vulnerability regarding project evaluation. In facilities without automated Key Performance Indicators (KPIs), staff reported that the success of the team model felt like "just a feeling" rather than a verified operational improvement. This underscores the necessity for Olskroken to establish clear, measurable metrics within Asynja and Medrave. Operating in continuous PDCA (Plan-Do-Check-Act) cycles and actively tracking quantitative success is essential for long-term sustainability.

To ensure that the consolidated single-team model functioned as an active learning system in the DMAICL model rather than an ad-hoc emergency workaround, two key operational mechanisms should be employed. Telia ACE was configured for strict birth-date-based routing, routing calls directly to the consolidated nurse. To support this triage, the team activated visual color-coding banners inside Asynja. This visual matching acted as a Poka-Yoke (mistake-proofing) mechanism, allowing triage nurses to instantly identify active cohort patients and open their standardized "TEAM_PLAN" records, ensuring clinical continuity (Wang et al., 2025).

Instead of evaluating a compromised, understaffed model, the project should adapt to stress-test a lean, highly resilient alternative engineered specifically for modern primary care environments facing severe physician and nursing shortages. By maintaining strict sampling controls in the DMAICL model over the birth dates (11, 12, 14, 15) and tracking empirical metrics through Telia ACE, an action research design to preserve its quantitative precision while demonstrating how operational resilience can be achieved through cross-functional synergy (Dellafiore et al., 2025; Wang et al., 2025).

5

Results and Analysis

This chapter presents and analyses the results generated across the Define, Measure, Analyze, and Improve phases of the DMAICL framework at Närhälsan Olskroken. Section 5.1 establishes the organizational and structural baseline of the clinic. Section 5.2 examines the fragmentation produced by the patient-responsible doctor (PAL) system. Section 5.3 presents the empirical results from the staff pulse survey and the two comparative semi-structured interviews. Section 5.4 details the proposed cross-functional care team structure. Section 5.5 describes the proposed reconfiguration of the Telia ACE telephony system into an intelligent one. Section 5.6 addresses each of the three research questions in turn, synthesizing baseline data, comparative case evidence, and theoretical frameworks to assess the structural prerequisites for transition, the anticipated impact on care continuity and healthcare utilization, and the projected effects on the staff work environment.

5.1 Current State Analysis and Organizational Structure

The study is conducted at Närhälsan Olskroken, a primary care center in Gothenburg, Sweden, serving approximately 14,306 listed patients. The clinic employs around 50 staff members, including 4.62 full-time specialist physicians and 4.5 ST (specialist in training) doctors. An organizational structural analysis revealed a distinct administrative separation between the primary medical care division and the rehabilitation division within the same building. This structural context is critical, as bridging these administrative silos is a central component of the proposed intervention. (Närhälsan Olskroken, 2025).

To successfully design an intervention, it is imperative to thoroughly map the existing workflows and identify the structural bottlenecks at Närhälsan Olskroken. The current operational model relies heavily on a patient-responsible doctor model, where patients are distributed to physicians based on their birth dates. While conceptually sound for establishing long-term patient-doctor relationships, the practical application of this model at the clinic has led to systemic fragmentation.

5.2 Fragmentation and the Patient-Responsible Doctor System

The primary vulnerability of the current patient-responsible doctor system is a lack of resilience against staff absences. When a physician is unavailable due to illness, parental leave, or the mandatory six-month hospital rotations that are required for ST (specialization training) doctors, their listed patients essentially lose their primary care anchor. Consequently, patients are forced to consult substitute doctors or various nurses, necessitating the repeated recounting of complex

medical histories. This lack of continuity creates significant inefficiencies: clinicians spend disproportionate amounts of time reviewing disparate medical records to understand a patient's background, reducing the time available for actual medical intervention.

5.3 Survey and Interview Result

Figure 5.1 shows the result of the survey carried out, and Table 3 shows the response of the interview conducted. The respondent and interviewee will be anonymized for privacy reasons. The naturalistic design includes observing the daily workflows, specifically the transition of the 13:00 administrative hour into the targeted "Red Flag" rounds.

Form Responses						
Timestamp	During the past two weeks, I have felt that my daily workload is manageable.	I feel that I receive adequate support from colleagues when making difficult medical assessments.	I feel that our current daily meetings (13:00 rounds) help me solve complex patient cases efficiently.	What is one thing that caused unnecessary stress for you this week?	How would you rate the current level of inter-professional collaboration at Närhälsan Ölskroken?	To what extent do you feel confident in the process for handing over patient cases to colleagues?
3/3/2026 12:11:53	Strongly agree	Strongly agree	Strongly agree		Good	Neutral
3/3/2026 12:15:56	Neither agree nor disagree	Agree	Neither agree nor disagree	time pressure	Good	Confident
3/3/2026 13:05:41	Neither agree nor disagree	Agree	Neither agree nor disagree		Good	Very confident
3/4/2026 9:45:20	Agree	Agree	Agree	Clocking in and out at lunch.	Good	Neutral
3/4/2026 12:52:35	Agree	Agree	Neither agree nor disagree		Fair	Neutral
3/4/2026 16:21:50	Agree	Agree	Neither agree nor disagree		Good	Confident

Figure 5.1: Responses from the survey

Theme / Question Focus	Interview 1 Response	Interview 2 Response
Team Structure & Composition	4 teams. Each has 2 doctors, 3-4 nurses, 1-2 assistants, and 1 secretary.	3 teams. Member counts vary (1-3 doctors per team). Nurses rotate across teams depending on needs.
Patient Distribution	16,000 total patients. Assigned to teams based on birth dates.	3,000-4,000 patients per team. Assigned to teams based on birth dates.
Target Patient Groups	Distributed equally. Elderly (80+) have a dedicated phone line and home-care nurses.	General population (typically excluding young children). Teams are deemed best for complex or uncertain cases.
Rehab Staff Integration	No. Team nurses refer patient details to a separate rehab center, which then contacts the patient.	No. Rehab is entirely separate due to low staffing levels, though integration would be beneficial.
Telia ACE & Call Routing	16 daily nurses. Calls are routed directly to the specific team by birth date.	Nurses answer all calls. Urgent cases are booked immediately; non-urgent cases are assigned to the team.
Duration of Team-Based Care	3 years.	1.5 years.

Daily Team Meetings	Meet 3 times a week for 3 hours. Focus: Brainstorming treatment plans based on completed test results.	Meet up to 4 days a week for 45 minutes. Focus: Mostly administrative tasks, like moving patients between booking lists.
Handling Staff Absences	Nurses continue patient care using the established treatment plan.	Patients are passed to available staff. Care relies entirely on the written patient journal without verbal handoffs.
Impact on Re-contact Rate	Reduced re-contact rates and shorter waitlists.	No visible reduction. Teams are currently not utilized effectively to address this issue.
Measuring Success & KPIs	No automated KPIs due to system limits. Manually observed drop in calls/waitlists. Increased collaboration.	Completely unmeasured. Staff feel it is an improvement, but without data. The interviewee feels the process is slow and lacks flow.
Staffing & Challenges	Initial staff resistance was managed by mixing cooperative and resistant staff within teams.	Severe understaffing (only 4.5 nurses handling all patients). Patients primarily complain about wait times.
Suggestions for Improvement	<i>(Not explicitly addressed)</i>	Open booking calendars further in advance. Book simple cases immediately and reserve teams solely for complex patients.
Proactive Follow-ups	<i>(Not explicitly addressed)</i>	No proactive system exists. Chronically ill patients are only identified when they contact the clinic.

Table 3: Interview Transcripts: Comparative Analysis

5.4 Synergy of the Proposed Cross-Functional Team Structure

The operational mechanics, communication channels, and information-sharing pathways of this cross-functional team are visualized in Figure 5.2. Rather than allowing clinicians to operate in professional or administrative silos, this structural framework realigns the clinic's human capital to work collaboratively around the patient.

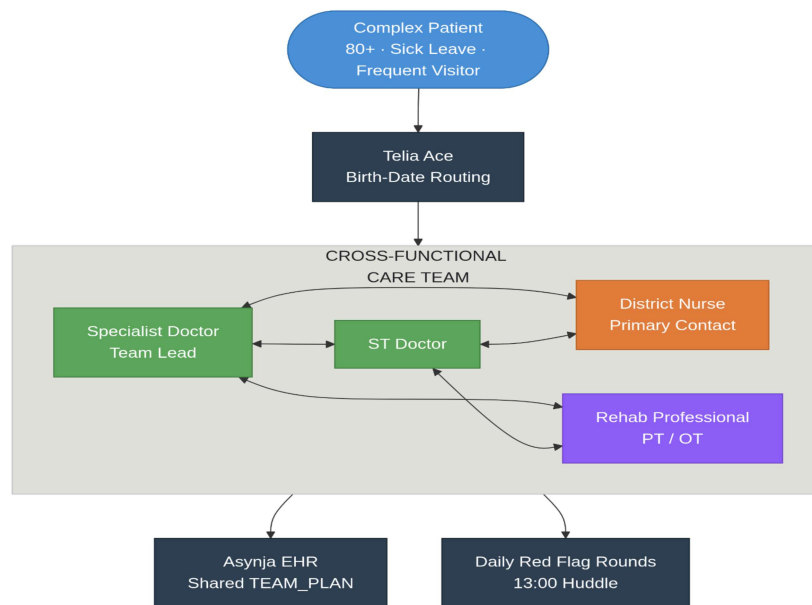


Figure 5.2: Proposed cross-functional care team structure at Närhälsan Olskroken

Figure 5.3 presents the proposed cross-functional care team structure designed for Närhälsan Olskroken as the primary operational output of the Improve phase. The model organizes clinical staff into four interdependent roles arranged horizontally within a defined team boundary: a specialist doctor serving as team lead, an ST doctor, a district nurse functioning as the primary patient contact, and a rehab professional (physiotherapist or occupational therapist). The inclusion of the rehabilitation professional within the team boundary, rather than as an external referral endpoint, represents the single most significant structural departure from the current patient-responsible model, directly addressing the organizational silo identified in the analysis phase.

Patient access to the team is governed at the top of the structure by birthdate routing through the Telia Ace telephony system, which ensures that incoming calls are directed to the nurse assigned to the patient's designated team rather than to a generalized queue. This configuration eliminates the triage waste identified in Section 4.2.2, where nurses were required to make clinical routing decisions without access to patient history or physician input.

Within the team, communication is bidirectional across all four roles, replacing the current sequential, physician-dependent handoff model with a lateral coordination structure. This is operationalized through two shared infrastructure outputs at the base of the diagram: the Asynja EHR TEAM_PLAN, which standardizes documentation and ensures care continuity in the absence

of any individual team member, and the daily 13:00 red flag round, which converts the existing unstructured administrative block into a protected, interprofessional co-decision forum.

5.5 Telia ACE Proposed Reconfiguration

The Telia ACE system would be reconfigured into an intelligent routing engine that interfaces dynamically with regional communication networks and internal clinical databases. The system will process incoming patient inquiries through a defined, multi-stage routing protocol designed to minimize handoffs and optimize queue times:

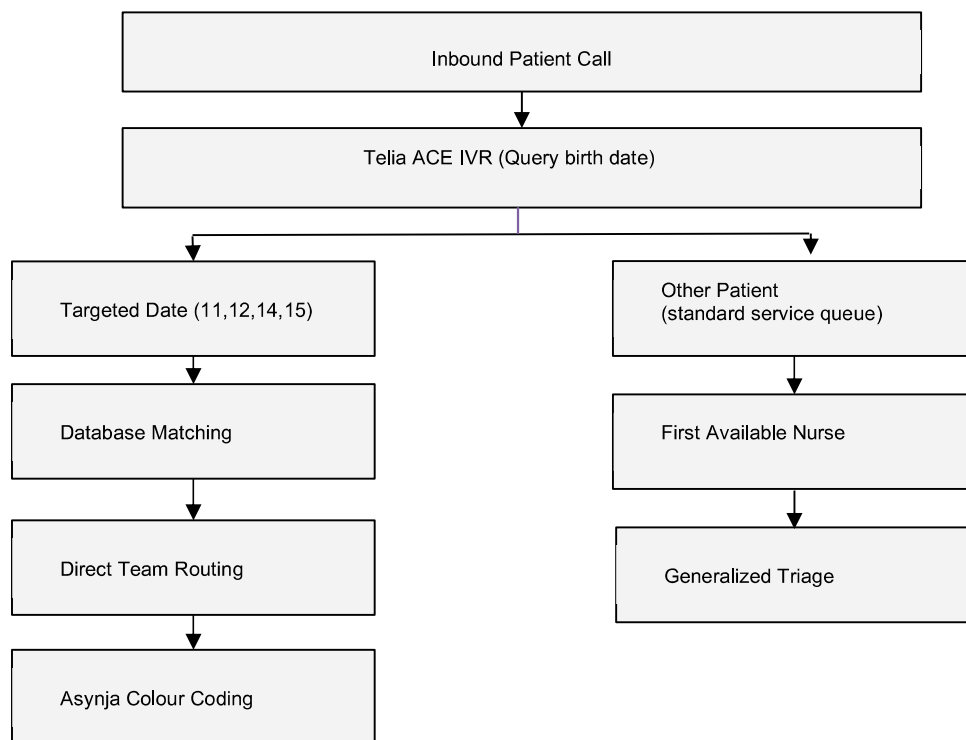


Figure 5.3: Proposed Telia ACE system architecture

When a patient initiates telephone contact, Telia ACE serves as the first-line digital filter. While vulnerable elderly groups (specifically those aged 80 and above) completely bypass the automated system via a dedicated, direct-dial phone line to preserve care continuity, the general listed population is processed through the main IVR engine (Närhälsan Olskroken, 2025). The platform requires patients to input their eight-digit birth date (DDMMYYYY) using their phone keypad. Telia ACE utilizes this numerical input as an objective sorting parameter to partition the incoming patient volume before any human clinical assessment takes place.

Instead of routing all incoming calls into a massive, generalized queue, Telia ACE will be programmed to isolate and partition the traffic. During the pilot phase of this study, the platform was configured to identify patients belonging to the designated test cohorts, specifically those born on the 11th, 12th, 14th, and 15th of any month (Närhälsan Olskroken, 2025).

6

Discussion

This chapter interprets the findings of the DMAICL analysis at Närhälsan Olskroken in light of the theoretical frameworks established in Chapter 2, addresses each of the three research questions, reflects on the methodological limitations of the study, and identifies avenues for future research. The discussion moves from the structural and workflow conditions underpinning a successful transition (RQ1), through the anticipated effects on care continuity and healthcare utilization (RQ2), to the implications for the staff work environment (RQ3).

6.1 Structural and Workflow Conditions for a Successful Transition (RQ1)

The first research question asked what critical structural and workflow components are required to successfully transition a primary care center from an individual-provider (PAL) system to a cross-functional, team-based care model. The findings converge on three interdependent prerequisites: organizational de-siloing, technological re-configuration, and standardized clinical protocols.

The most fundamental structural prerequisite is overcoming the administrative separation between the primary care division and the rehabilitation division. As Dellafiore et al. (2025) established, effective interprofessional collaboration is not a spontaneous outcome of physical proximity but a deliberately engineered relational and organizational arrangement requiring structural alignment, shared governance, and protected time for joint care planning. The finding that Olskroken's rehabilitation staff are physically collocated yet systematically excluded from daily medical rounds is a textbook case of what Dellafiore et al. (2025) describe as fragmented organizational cultures that impede shared decision-making. The proposed integration of rehabilitation professionals into the 1pm meeting rounds on Tuesdays, directly addresses this gap by creating a shared governance space in which medical and rehabilitative perspectives are jointly applied to complex cases, aligning with the "God och nära vård" reform's vision of coordinated, co-created care across professional boundaries

The second structural prerequisite is the reconfiguration of the Telia Ace telephony system for birth-date-based routing. Current workflow mapping revealed that incoming calls are handled by whichever nurse is first available, stripping the interaction of contextual knowledge that makes coordinated triage possible. This finding is consistent with the lean principle that waste, waiting, overprocessing, and correction are generated by process instabilities such as poorly designed routing standards that prevent the right competence from reaching the right patient at the right time

(Pieńkowski, 2014). The comparative interviews were unambiguous: the mature three-year team implementation reduced re-contact rates and wait times precisely because birth-date routing gave triage nurses prior knowledge of a patient's care plan, while the generalized-queue facility reported no visible improvement, providing strong empirical support for the claim by Morales-Contreras et al. (2020) that lean process innovation must address structural flow conditions, not merely individual task performance.

The third prerequisite is the standardization of follow-up documentation within the Asynja EHR system. The baseline analysis uncovered doctor practices of blocking follow-up appointments in personal calendar slots or paper notes, nonstandardized workarounds that are entirely lost when the physician is absent. This is precisely what muda Pieńkowski (2014) categorizes as correction: unnecessary rework generated by a weak upstream process standard. Replacing these informal practices with structured, team-visible documentation converts tacit individual knowledge into shared organizational knowledge, making care continuity resilient to individual absences, a principle Kollberg et al. (2007) demonstrated produces measurable quality improvements in Swedish healthcare settings.

A fourth structural prerequisite, implicit in the comparative interview findings, is committed clinical leadership. Melo et al. (2022) identify leadership engagement as the single most frequently cited facilitator of lean healthcare transitions across 102 reviewed studies, and its absence as the most common cause of implementation failure. The successful three-year implementation explicitly managed initial staff resistance through deliberate team composition, a leadership decision, not a structural one. Without sustained, visible support from senior physicians and clinic management, the structural changes to Telia ACE, Asynja, and team composition risk being implemented as administrative compliance rather than embedded as operational culture. This aligns with Wang et al.'s (2025) finding that hospitals sustaining lean improvement over time share a leadership culture that treats operational difficulties as information about the system rather than as personal failure.

6.2 Team-Based Care, Continuity, and Healthcare Utilization (RQ2)

The second research question asked how the implementation of a team-based care model affects care continuity and healthcare utilization for high-need patient populations. While the pilot phase remains ongoing and full longitudinal outcome data are not yet available, the baseline findings and comparative case evidence allow well-grounded projections for each of the three target groups.

For patients aged 80 and above, 517 individuals in the current dataset, the fragmentation of the patient-responsible doctor model poses the most acute clinical risk. This targeted group typically presents with multimorbid conditions requiring longitudinal oversight rather than episodic reactive intervention; when ST doctors rotate out for six-month hospital placements, their complex medical histories cannot be efficiently reconstructed by substitute physicians in a single consultation. The

team-based model distributes clinical knowledge across the whole team, ensuring nurses and remaining physicians maintain continuity of the care narrative even during individual absences, consistent with Dellafiore et al.'s (2025) finding that well-structured GP–nurse dyads, “while a dyad, a two-person collaborative pair, is the smallest unit of interprofessional collaboration and does not constitute a team in the full organizational sense, it functions as the foundational relational building block from which larger care teams are constructed” (Dellafiore et al., 2025), provide enhanced responsiveness to socially complex and multimorbid populations. Anticipated outcomes include a reduction in unnecessary emergency department visits, as structured Red Flag rounds enable proactive identification of deteriorating patients before crisis presentations occur.

For patients on long-term sick leave (more than two months), 177 individuals in the baseline data, the most critical failure was the absence of active, documented rehabilitation plans. The organizational silo between medical and rehabilitation staff allows these patients to remain on sick leave without coordinated clinical input, a phenomenon directly mirroring the macro-level coordination gap Anell, Glenngård, and Merkur (2012) document at the national level, where Sweden's administrative separation of regional medical care and municipal rehabilitative care has historically produced systemic fragmentation. By integrating rehabilitation professionals into cross-functional team meetings and standardizing sick leave plan documentation in Asynja, the proposed model creates the conditions for proactive rather than reactive care, consistent with Wang et al.'s (2025) systematic review finding that lean process redesign improves care timeliness and reduces redundant contacts.

For frequent visitors, 363 individuals with five to twenty-two annual contacts, the proposed changes to telephony routing and team-structured triage are expected to yield the most immediate effects on re-contact rates. The Telia Ace reconfiguration ensures these patients speak to nurses who know their care plan, enabling genuine resolution of underlying issues rather than appointment-booking as a temporary fix, consistent with the Nuka System of Care finding that direct team-level routing drastically reduces unnecessary visits by ensuring care interactions are coordinated rather than episodic (Gottlieb, 2013).

A broader implication relates to measurement infrastructure. Both external interviews revealed that success in team-based transitions is frequently experienced as a subjective “feeling” rather than a verified operational outcome, because automated KPIs are not configured in clinic systems. Kollberg et al. (2007) argue that continuous improvement in healthcare requires quantified waste metrics linked to standardized corrective action; without this, lean transformation risks remaining anecdotal rather than embedded and sustainable. This underscores the necessity of establishing automated metrics before Phase 2 scaling begins. Phase 2 scaling begins: (1) the continuity index, defined here as the Usual Provider Continuity (UPC) index, calculated as the proportion of a patient's total visits within a twelve-month period that are made to their designated team, with a higher score indicating stronger continuity; (2) the re-contact rate, measuring the proportion of

patient contacts that generate an additional, unplanned contact within 72 hours; and (3) the proportion of sick leave patients with an active, documented rehabilitation plan recorded in Asynja. These three metrics, tracked in Asynja and Medrave, should form the quantitative backbone of the Phase 2 evaluation.

6.3 Team-Based Care and the Staff Work Environment (RQ3)

The third research question asked how the shift to a team-based workflow influences staff's perceived work environment, specifically regarding interprofessional collaboration, workload manageability, and support in clinical decision-making. The qualitative findings from the staff survey and comparative interviews point to both significant benefits and important implementation risks.

The six-response baseline pulse survey conducted in March 2026 provides a preliminary quantitative signal of the current staff experience at Olskroken. Five of six respondents rated the current level of interprofessional collaboration as "Good," and five rated their confidence in patient handover as "Confident" or "Neutral." However, four respondents rated the current 13:00 rounds as only "neither agree nor disagree" in terms of helping solve complex patient cases efficiently, a finding that directly validates the observation from the external interviews that meeting time not protected for clinical co-creation provides little collaborative benefit. The small sample size (n=6) prevents statistical inference, and the voluntary participation design introduces self-selection risk; these results therefore serve as directional indicators rather than confirmed findings, and a post-implementation resurvey with broader participation is essential for measuring change.

The most consistently reported benefit across the interviewed organizations was the reduction of professional isolation, particularly among triage nurses. Under the current patient-responsible doctor model, Olskroken's triage nurses make complex medical routing decisions without real-time access to a physician or contextual patient knowledge, forcing them to operate beyond their most effective scope while simultaneously underutilizing their clinical expertise. As Dellafiore et al. (2025) document, this isolation is a known source of job dissatisfaction and professional stress. The red flag rounds create a structured daily forum in which nurses, physicians, and rehabilitation staff jointly assess complex cases, distributing clinical decision-making responsibility across the team, an arrangement expected to improve workload manageability and role clarity, both of which Dellafiore et al. (2025) identify as critical enablers of sustainable interprofessional collaboration.

However, the findings also reveal significant cultural and implementation risks. The external interview with the more recent (1.5-year) implementation site exposed a critical pattern: team meetings that default to administrative coordination rather than clinical co-creation provide little of the collaborative benefit that motivates the transition in the first place. Wang et al. (2025) observe that sustaining lean healthcare improvements requires a collaborative culture in which staff are engaged in genuine problem-solving; meeting time consumed by scheduling logistics does not build this culture. For Olskroken, this means the structural design of the red flag rounds, with

an explicit clinical agenda and an expectation that all professions contribute, is as important as their mere scheduling, and leadership must actively protect this focus against the organizational gravity that pulls meetings toward administrative convenience.

The issue of initial staff resistance is also theoretically significant. The successful three-year implementation (interviewee 2, personal communication, March 16, 2026) managed early resistance by deliberately composing teams that mixed cooperative and hesitant staff, preventing resistance from clustering. This is consistent with lean literature's emphasis on psychological safety as a prerequisite for honest waste identification: Wang et al. (2025) note that organizations sustaining lean improvement treat operational difficulties as information about the system rather than as personal failure, a framing that requires staff to feel safe raising concerns. Kollberg et al. (2007) similarly emphasize that continuous improvement succeeds in Swedish health settings when leadership creates an environment where performance deviations prompt inquiry rather than blame. The recommendation to mix staff dispositions within teams is therefore not merely a pragmatic management technique but a structural investment in the psychological conditions that make iterative improvement possible.

Finally, the action-research-based design of this study carries methodological implications for how success is assessed. Lincoln and Guba (1985) establish that trustworthiness in naturalistic qualitative research depends on credibility, transferability, and confirmability, achieved here through member-checking of qualitative themes with clinical staff, detailed contextual description enabling transferability assessment, and grounding interpretations in participant narratives rather than administrative assumptions. This does not, however, reduce the importance of quantitative validation: the PDCA cycle demands that its check phase be driven by objective operational data. The pilot evaluation must therefore combine naturalistic qualitative evidence of staff experience with continuity index and re-contact rate data from Asynja and Telia ACE, so that the decision to scale to Phase 2 is grounded in both experiential validity and operational evidence.

6.4 Limitations

Several limitations must be acknowledged. First, the pilot intervention was ongoing at the time of writing, and longitudinal outcome data, including post-implementation continuity indices, re-contact rates, and staff satisfaction scores, were not yet available for full analysis, meaning that discussion of anticipated outcomes is grounded in comparative case evidence and theoretical inference rather than measured post-intervention data at Olskroken. Second, the voluntary participation design of the staff survey introduces self-selection bias, as staff who chose to respond may hold systematically different views from those who did not. Third, the external interview sample comprised only two facilities, which limits the comparative generalizability of conclusions drawn from their contrasting experiences. Fourth, the structural separation of the rehabilitation division means that rehabilitation staff were less represented in the baseline data collection, potentially underestimating the depth of the silo effect and the effort required to bridge it.

Fifth, and most fundamentally, the action research design is inherently bound to Närhälsan Olskroken's specific organizational context. The staffing ratios (4.62 specialist FTEs and 4.5 ST doctors for 14,306 patients), patient demographic profile, and the administrative separation between primary care and rehabilitation divisions are particular to this facility and to Närhälsan's regional governance structure within Västra Götaland. The three structural prerequisites identified in RQ1, de-siloing, Telia ACE reconfiguration, and Asynja documentation standardization, may require significant adaptation before they are transferable to clinics with different resource profiles, EHR platforms, or regional administrative arrangements. The comparative interview evidence from Vara and Majorna suggests directional validity within the Närhälsan network, but systematic investigation of fidelity and outcome replication across other facilities remains a necessary condition for claiming broader applicability.

7

Conclusion

This study makes three distinct contributions. Practically, it delivers a concrete, implementable model with three specific interventions grounded in Olskroken's own data and staff feedback. Methodologically, it demonstrates the applicability of the DMAICL framework as a bridge between academic action research and practical quality improvement in Swedish primary care, complementing the naturalistic inquiry tradition (Lincoln & Guba, 1985). Theoretically, the study adds to evidence on interprofessional collaboration by illustrating how Sweden's macro-level administrative fragmentation (Anell, Glenngård, & Merkur, 2012) reproduces itself as operational silos at the clinic level and how team-based redesign can interrupt this pattern when structural, technological, and cultural dimensions are addressed simultaneously (Dellafore et al., 2025; Morales-Contreras et al., 2020).

Närhälsan Olskroken's transition to team-based care represents a critical shift from a reactive, individualistic medical model to a proactive, collaborative care system. By leveraging the DMAICL framework to integrate technological triage (Telia ACE), standardize EHR documentation (Asynja), and break down administrative silos, the clinic is positioned to significantly enhance care continuity for its most vulnerable patients. Ultimately, this thesis demonstrates that in the face of national physician shortages and complex patient needs, the solution is not working harder in isolation but working smarter together.

7.1 Future Research

The findings generate several productive directions for future research. Most immediately, a follow-up study measuring the continuity index, re-contact rates, and sick leave plan completion rates at six and twelve months post-implementation would provide the longitudinal evidence needed to assess whether structural and workflow changes translate into projected patient outcome improvements. Future research could examine how the professional composition and tenure of a care team affect the consistency of red flag rounds. The interview data suggest that maintaining clinical focus during interprofessional huddles is decisive for their effectiveness, but the conditions under which this is sustained across different team configurations remain unexplored. Finally, the applicability of the model to other Närhälsan facilities in the Västra Götaland region also deserves systematic investigation, since the model was designed for Olskroken's specific staffing structure and patient demographics.

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Appendix

The appendix presents a general sample of the interview guide. The exact questions given to each respondent varied depending on the role and organization of the interviewee.

- How many teams do you have? How are the team members distributed in each team?
- How many patients does the healthcare facility have assigned to it?
- Does the team focus on a particular group of patients?
- How were the patients distributed?
- Was there any resistance from any team member when the team-based care was implemented? How was it handled?
- How does the team manage continuity in the absence of a doctor?
- Is there a rehab nurse within the team for a patient who requires rehabilitation?
- How did you manage patients before the team-based care transition?
- How does the patient contact the team responsible?
- How often does the team meet to discuss patient cases?
- How long has the team-based care been functioning?
- What are the metrics used to measure the success of the team-based care implementation?

Future Outlook

- What specific operational and scheduling adaptations are required to successfully scale the cross-functional Care Team model to the general, lower-acuity patient population without overwhelming existing resources?
- How do continuity indices, re-contact rates, and wait-list volumes evolve after one to three full years of team-based care implementation?
- What is the measurable economic impact of transitioning to a team-based care model?



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