MASTER

The relationship between continuity of care and quality of an outpatient department

van Dongen, R.A.

Award date: 2014

Link to publication
The relationship between continuity of care and quality of an outpatient department.

By R.A. van Dongen

BSc
Student identity number 0631975

In partial fulfilment of the requirements for the degree of

Master of Science
In Operations Management and Logistics for the Healthcare

Supervisors:
Dr. ir. P.A.M. Kleingeld, TU/e, HPM
Dr. P.M.E van Gorp, TU/e, IS
Mevr. R. Gunnewijk, Elisabeth-Tweesteden ziekenhuis
Subject headings: continuity of care, quality, patient satisfaction, outpatient department, hospital organization.
Preface

In this report I present you the results of my master thesis project, which is the result of a seven-year period fulfilling my bachelor’s and master’s degree at the TU/e. A period in which I took the time to learn everything there is to learn about industrial engineering in the healthcare sector, living on my own in Eindhoven, and mainly about myself. After a hazing for my sorority, a board year at UniPartners, and an exchange semester in Singapore I thought I knew who Renske was. Yet, I can say I have learned a couple of new things the last few months: how insecure I can be about my abilities, how difficult it was to start with a project without a clear focus, how much I dislike literature research, and how much I have enjoyed convincing people to participate in my research. This project confirmed two important personal characteristics for me: I am a social person who gets energy from working with people, and I need feedback in order to increase my self-confidence. Two aspects I definitely should search for in my future job!

Of course, I could not have done this research without supervision from the university and the hospital organization. I would like to thank Ad Kleingeld for the support and feedback I really needed during this project. Especially during the literature research about quality of an outpatient department, a topic that was unfamiliar for Ad as well, he convinced me to continue and stay positive about this project. Secondly, I would like to thank Pieter van Gorp for his supporting function and contribution to the academic focus of this research. A special thanks goes to Renée for facilitating my research in the three hospitals, introducing me to team leaders and surgeons, and promoting my research in the Partnership. But the informal conversations during my visits to the hospitals I appreciated the most. And last but not least I would like to thank Josien and Femke, the outpatient department assistants, and all the surgeons who taught me everything I needed to know about the outpatient departments and were always willing to answer questions or participate in my research.

Renske van Dongen
November 2014
Management summary

This master thesis graduation project was performed at the Elisabeth-Tweesteden hospital. The request from the Partnership Surgery was to research the functioning of the three surgery outpatient departments (ODs) and their quality. The project can be divided into four phases, as can be seen in Figure: 1) a literature review, 2) the pre-diagnosis and problem definition, 3) analysis and diagnosis phase, and 4) discussion and conclusion.

Literature review
The first phase focused on the topic of interest: quality of an outpatient department. In this study quality of an OD is defined as ‘the degree to which the organization delivers high-quality care, has a staff orientation, and incorporates responsive governance; the organization focuses on the patients, the community, and the employees’ (WHO, 2003; IOM, 2001). The literature review resulted in a quality framework with 6 dimensions of quality: clinical effectiveness, efficiency, staff orientation, responsive governance, safety, and patient-centeredness (WHO, 2003). Sixteen factors that contribute to these dimensions were extracted and completed the framework that is shown in Table 1. This quality framework can be used for quality assessment and improvement of Dutch ODs.

Table 1. Quality framework for an outpatient department.

<table>
<thead>
<tr>
<th></th>
<th>Clinical Effectiveness</th>
<th>Efficiency</th>
<th>Staff Orientation</th>
<th>Responsive Governance</th>
<th>Safety</th>
<th>Patient centeredness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared values</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empowerment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary spanning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication (patient)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocols</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting times</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pre-diagnosis
The second phase in this project was defining a specific problem that could be analysed in the third phase. Quality proved to be a very broad concept; therefore an initial problem diagnosis was executed to develop a specific problem definition. Bottlenecks that OD assistants, team leaders, and surgeons encounter at the outpatient department were collected in 11 interviews. Furthermore, a small sample (n=16) of patients in the waiting rooms of the three locations was asked to complete a short questionnaire consisting of four questions about quality aspects and patient centeredness of the OD. The interviews and survey resulted in 57 bottlenecks, after evaluation the final list of bottlenecks used for further analysis included 33 bottlenecks.

The bottlenecks were analysed using Porras’ (1987) stream analysis method, which is a technique that guides the diagnosis of organizational problems. In the stream analysis method the problems are categorized into
different organizational dimensions: the streams. The bottlenecks will be visualised into a stream diagnostic chart in which the several streams, problems and interconnections are visible.

The stream chart was used to formulate a specific problem statement about one important bottleneck: the patient-provider relationship. The final two phases of this research focused on answering the main research question of this report:

**How can consultation hours at the outpatient department be organized with respect to continuity of care, in order to improve the quality of the outpatient department?**

**2nd literature review**
First, a second literature review about the topic ‘continuity of care’ was performed. Reid et al. (2002) distinguish among three types of continuity, which often exist in parallel and include different characteristics of continuity. Informational continuity is the availability and use of patient information about prior events (e.g. past visits, lab results, referrals). The use of this information ensures the appropriateness of the current care for the individual patient. Information transfer and communication between care providers are essential for this type of continuity (Hjortdahl, 1992). The second type of continuity is relational continuity, which recognizes that sustained contact between a patient and a doctor is a factor that connects the provided care over time. Management continuity is defined as a consistent and coherent approach to the management of a health condition that is responsive to a patient’s changing needs (Haggerty et al., 2003). It is important that different doctors over time complement each other and do not forget or repeat procedures. Management continuity focuses on the treatment of a patient and the consistency of the delivered care.

**Analysis & diagnosis**
The third phase, analysis and diagnosis, included administering a questionnaire with both patients and specialists about experienced continuity of care and quality, and analysing these data. Participants from three continuity scenarios were compared:

- Scenario 1: Patients receive care for one medical complaint from multiple doctors.
- Scenario 2: Patients receive care for one medical complaint from one doctor.
- Scenario 3: Patients receive care for one medical complaint from multiple doctors but patients follow a pre-defined care path.

Patients were assigned to one of the three scenarios based on their medical history (i.e. visits to specialist from which type of sub-specialty) and previous appointments at the OD. In all three scenarios information systems that could contribute to the level of informational continuity were present. In scenario 2 relational continuity of care was present. Patient groups that received treatment according to a standard care path or treatment plan were selected for scenario 3, in which management continuity was present. Within these scenarios patients were divided into two groups: young vs. old patients (age), and patients with a chronic/complex vs. non-severe medical complaint.

Patients were asked to answer a questionnaire that included questions about the perception of the three types of continuity of care and a set of
questions about patient satisfaction. Surgeons of all participating patients were asked to answer a set of questions about their experienced informational and management continuity and satisfaction with one's performance and extra time spent on patients.

Results from a regression analysis indicated that experienced management and relational continuity of care account for circa 40% of the variance in patient satisfaction. Therefore, increasing the continuity of care at the OD will significantly increase patient satisfaction and thereby quality. A 40 per cent variance can be considered high given that other variables influencing patient satisfaction (i.e. friendliness staff, waiting time, accessibility OD) were not accounted for in this regression equation (Hallowell, 1996). But although literature predicted quality differences between the three scenarios and average scores indicated multiple differences, this research did not yield significant differences. Patient satisfaction does not differ significantly per scenario, as can be seen in Table 2.

**Discussion & conclusion**

Although the study did not yield many significant results, the research design ensured a theoretical contribution. The research design with three scenarios of continuity and a focus on surgical patients, met current needs indicated by other researchers (Uijen, 2012; van Walraven et al., 2010). Another strength of the research design is the combination of qualitative and quantitative research, in which the problem statement was derived from findings from a comprehensive initial problem analysis that was based on Porras’ stream method.

**Limitations**

Limitations of this study are related to the sample size, participants, measurement scales, and data analyses. The most important limitation was the sample size: the sample size was too small to detect small effects between the scenarios or patient groups within the scenarios. A notable limitation concerning the participants was the high patient satisfaction score (M = 4.11, SD = .48, on a 5-point scale), which makes it difficult to detect differences between scenarios and patient groups. The third significant limitation was the measurement of quality of an OD. Two measurement scales that were included in the questionnaires were omitted from analyses: satisfaction with performance and extra time spent. The first set of questions did not exclusively measure satisfaction with performance and an accurate indication of extra time spent could not be inferred from the specialists’ answers. As a result, quality was only measured using one factor: patient satisfaction. Therefore, it is difficult to draw general conclusions about the relationship between continuity of care and quality of an outpatient department.
Recommendations

Two major general recommendations are to combine the outpatient departments in one building and to evaluate and change the planning system. Both bottlenecks are causing many other problems. Relational continuity of care could be increased when the planning takes this constraint into account. However, these bottlenecks are not easily resolved and therefore two more practical recommendations are given as well.

The practical recommendations can increase the continuity of care and thereby quality of the outpatient department. Firstly, optimize the allocation process of patients to one or multiple doctors to increase patient and specialist satisfaction. Patients should get the choice if they prefer to be treated by one doctor, and thereby accepting possible longer waiting times, or if they do not have a preference and thereby are scheduled when there is availability in the planning (Freeman & Hughes, 2010). But also preferences of specialists should be taken into account when scheduling patients, because it will influence their satisfaction as well. A second recommendation is to increase informational continuity by using protocols or guidelines for the administration in EMRs and summaries to increase the knowledge transfer between doctors.
Management samenvatting

Dit master afstudeerproject is uitgevoerd in het Elisabeth-Tweesteden ziekenhuis. De vraag van de maatschap chirurgie was om het functioneren en de kwaliteit van de drie poliklinieken heelkunde te onderzoeken. Het project kan worden verdeeld in vier fases, zoals te zien is in Figuur 2: 1) de literatuur studie, 2) een pre-diagnose en probleem definitie, 3) de analyse en diagnose, en 4) discussie en conclusie.

Figuur 2. Fases onderzoek

Literatuurstudie
De eerste fase van het onderzoek was gericht op het onderwerp ‘kwaliteit van een polikliniek’. In dit onderzoek is kwaliteit van een polikliniek gedefinieerd als ‘de mate waarin de organisatie hoogwaardige zorg levert, zich richt op haar werknemers, en een daadkrachtig bestuur heeft; de organisatie richt zich op de patiënten, de gemeenschap, en de medewerkers’ (WHO, 2003; IOM, 2001). De literatuur studie resulteerde in een kwaliteitskader met zes dimensies van kwaliteit: klinische effectiviteit, efficiëntie, personeel-oriëntatie, daadkrachtig bestuur, veiligheid en patiëntgerichtheid (WHO, 2003). Zestien factors die bijdragen aan deze dimensies zijn afgeleid uit de literatuur en completeren het kwaliteitskader dat is te zien in Tabel 3. Dit kader kan gebruikt worden voor kwaliteit assessment en verbetering van Nederlandse poliklinieken.


<table>
<thead>
<tr>
<th>Shared values</th>
<th>Clinical Effectiveness</th>
<th>Efficiency</th>
<th>Staff Orientation</th>
<th>Responsive Governance</th>
<th>Safety</th>
<th>Patient centeredness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Excellence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based medicine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary-spanning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication (patient)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information provision</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocols</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting times</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pre-diagnose
De tweede fase van dit project bestond uit het definiëren van een specifiek probleem dat geanalyseerd kon worden in de derde fase. Kwaliteit bleek een erg breed begrip te zijn en daarom werd een pre-diagnose gesteld om een specifiek probleem te definieren. Knelpunten die polikliniek assistentes, teamleden en chirurgen tegen kwamen tijdens het werken op de poli werden verzameld door middel van elf interviews. Daarnaast werd een kleine groep patiënten (n = 16) uit de wachtkamers van de drie poliklinieken gevraagd om een korte vragenlijst over kwaliteit en patiëntgerichtheid van de poli in te vullen. De interviews en vragenlijst resulteerden in 57 knelpunten die werden geëvalueerd zodat er een uiteindelijke lijst van 33 knelpunten ontstond die verder geanalyseerd werd.

Het stroomdiagram werd gebruikt om een specifieke probleemstelling te definiëren over één knelpunt: de arts-patiënt relatie. De laatste twee fases van dit onderzoek zijn gericht op het beantwoorden van de onderzoeksvraag: **Hoe kunnen de spreekuren op de poliklinieken wat betreft continuïteit van zorg worden georganiseerd zodat de kwaliteit verbetert?**

2e literatuurstudie
Eerst werd een tweede literatuurstudie over ‘continuïteit van zorg’ uitgevoerd. Reid et al. (2002) maken onderscheid tussen drie typen continuïteit die vaak naast elkaar bestaan en verschillende kenmerken van continuïteit bevatten. Informatie continuïteit is de beschikbaarheid en het gebruik van patiënten-informatie over eerdere gebeurtenissen. Het gebruik van deze informatie zorgt ervoor dat de juiste zorg aan een individuele patiënt geleverd wordt. Informatie overdracht en communicatie tussen zorgverleners zijn essentieel voor dit type continuïteit (Hjortdahl, 1992). Het tweede type is relationele continuïteit, dat erkent dat langdurig contact tussen een patiënt en een arts een factor is die de geleverde zorg over tijd verbindt. Management continuïteit wordt gedefinieerd als een consistente en coherente behandeling van een patiënt, die inspecteert op de veranderende behoeften van deze patiënt (Haggerty et al., 2003). Het is belangrijk dat de zorg van verschillende specialisten elkaar aanvult en dat ze geen handelingen vergeten. Management continuïteit is gericht op het behandelplan van een patiënt en consistentie van de geleverde zorg.

**Analyse & diagnose**
De derde fase omvatte het afnemen en analyseren van een vragenlijst bij patiënten en chirurgen over hun ervaren continuïteit van zorg en kwaliteit van de poli. Deelnemers uit drie continuïteit scenario’s werden vergeleken:
- Scenario 1: Patiënten ontvangen zorg van verschillende specialisten.
- Scenario 2: Patiënten ontvangen zorg van één specialist.
- Scenario 3: Patiënten ontvangen zorg van verschillende specialisten, maar deze patiënten volgen een vast omgeschreven zorgpad.

Patiënten werden op basis van hun medische geschiedenis (d.w.z. afspraken met chirurgen van specifieke sub-specialisaties) en vorige afspraken op de poli toegewezen aan één van de scenario’s. In alle scenario’s werden informatie systemen gebruikt die de informatie continuïteit kunnen faciliteren. In scenario 2 is relatie continuïteit aanwezig doordat patiënten één vaste arts hebben. Patiëntengroepen die zorg krijgen volgens een zorgpad of standaard behandelplan werden geselecteerd voor scenario 3 en ontvingen management continuïteit. Binnen de drie scenario’s werden patiënten verdeeld in twee groepen: jonge vs. oude patiënten (leeftijd), en patiënten met een chronische/complexe vs. een niet ernstige klacht.
Patiënten werden gevraagd om een vragenlijst te beantwoorden over hun ervaring van de drie typen continuïteit en de patiënttevredenheid. De chirurgen van alle deelnemers werden gevraagd een aantal vragen over hun ervaren informatie en management continuïteit, tevredenheid met hun prestatie en extra benodigde tijd voor een patiënt te beantwoorden.

Resultaten van een regressie analyse geven aan dat ervaren management en relatie continuïteit van zorg ongeveer 40% van de variantie in patiënttevredenheid verklaart. Een verklaarde variantie van 40% kan als hoog beschouwd worden aangezien andere variabelen die van invloed zijn op patiënttevredenheid niet werden meegenomen in deze regressie analyse (Hallowell, 1996). Het verbeteren van de continuïteit van de zorg op de poliklinieken zal dus leiden tot een hogere patiënt tevredenheid en daardoor kwaliteit. Alhoewel de literatuur kwaliteitsverschillen tussen de drie scenario's voorspelde, en gemiddelde scores dit bevestigden, leverde dit onderzoek geen significante kwaliteitsverschillen tussen de drie scenario's op (zie Tabel 4).

Discussie & conclusie
Alhoewel de studie weinig significante resultaten opleverde, draagt de onderzoeksopzet wel bij aan de theorie. De onderzoeksopzet met drie continuïteit scenario's en de focus op heelkunde patiënten voldoet aan de huidige vraag naar verder onderzoek, zoals aangeven door andere onderzoekers (Uijen, 2012; van Walraven et al., 2010). Een ander sterk punt van deze opzet is de combinatie van kwalitatief en kwantitatief onderzoek. De probleemstelling is gebaseerd op bevindingen uit een grondige initiële probleemanalyse die uitgevoerd werd met behulp van de Porras’ stroomanalyse methode.

Limitaties
Limitaties van dit onderzoek zijn o.a. gerelateerd aan de steekproef grootte, de deelnemers en de vragenlijst. De belangrijkste limitatie is de steekproef grootte, deze was te klein om kleine effecten tussen de scenario's of de patiëntengroepen in de scenario's vast te stellen. Een opvallende limitatie dat betreft de deelnemers is de hoge tevredenheid (M = 4.11, SD = .48, op een 5-puntschaal). Dit zorgt ervoor dat het moeilijk is om verschillen tussen de scenario's en groepen te onttrekken. Een derde limitatie is de meting van kwaliteit van de polikliniek. Twee schalen die opgenomen waren in de vragenlijst zijn weggelaten uit de analyses: tevredenheid met prestatie en extra benodigde tijd voor patiënten. De eerste set vragen bleek niet exclusief tevredenheid met prestatie te meten en een nauwkeurige indicatie van de extra benodigde tijd kon niet worden afgeleid uit de antwoorden van de specialisten. Daardoor is het moeilijk om algemene conclusies over de relatie tussen continuïteit van zorg en kwaliteit van de poli te trekken.
Aanbevelingen

Twee belangrijke algemene aanbevelingen zijn om de poliklinieken onder te brengen in één gebouw en om het huidige planningssysteem te evalueren en aan te passen. Beide knelpunten veroorzaken een groot aantal andere problemen. Relationele continuïteit zou vergroot kunnen worden als het planningssysteem deze restrictie (d.w.z. één arts per patiënt) meeneemt bij het inplannen van patiënten. Deze knelpunten zijn echter niet snel op te lossen en daarom worden er ook twee meer praktische aanbevelingen gegeven.

De praktische aanbevelingen kunnen de continuïteit van zorg vergroten en daarmee de kwaliteit van de polikliniek. Ten eerste, het optimaliseren van het toewijzingsproces van patiënten aan één vaste of meerdere specialisten om zo patiënt- en specialisttevredenheid te vergroten. Patiënten moeten de keuze krijgen of ze liever door één arts worden behandeld, en daarmee mogelijke langere wachttijden accepteren, of dat ze geen voorkeur hebben en worden ingepland wanneer er een plek vrij is (Freeman & Hughes, 2010). Maar ook de voorkeur van specialisten moet meegenomen worden bij het inplannen van patiënten, het beïnvloedt namelijk ook hun tevredenheid. Een tweede aanbeveling is het vergroten van de informatie continuïteit door middel van protocollen of richtlijnen voor de administratie in elektronische dossiers en samenvattingen die de kennis overdracht tussen specialisten kunnen vergroten.
## Contents

1. INTRODUCTION  
1.1 OVERVIEW OF THE STUDY  
1.2 ORGANIZATIONAL CONTEXT  
1.3 REPORT STRUCTURE  

2. THEORETICAL BACKGROUND  
2.1 THE OUTPATIENT DEPARTMENT  
2.2 QUALITY  
2.2.1 QUALITY FACTORS  
2.4 CONCLUSION  

3. PROBLEM DEFINITION  
3.1 INITIAL PROBLEM ANALYSIS  
3.1.1 STREAM ANALYSIS METHOD  
3.1.2 DATA COLLECTION  
3.1.3 SELECTION OF BOTTLENECKS  
3.1.4 BOTTLENECK CATEGORIZATION  
3.1.5 STREAM CHART  
3.1.6 PROBLEM STORIES  
3.1.7 LINK TO LITERATURE STUDY  
3.1.8 CONCLUSION  
3.2 PROBLEM STATEMENT  
3.2.1 LITERATURE REVIEW CONTINUITY OF CARE  
3.2.2 RESEARCH QUESTIONS  

4. RESEARCH METHOD  
4.1 RESEARCH DESIGN  
4.2 PARTICIPANTS  
4.3 PROCEDURE  
4.3.1 PREPARATION FOR DATA COLLECTION  
4.3.2 ADMINISTERING THE SURVEY  
4.3.3 CATEGORIZING THE PARTICIPANTS  
4.4 MEASUREMENT SCALES  
4.4.1 CONTINUITY OF CARE  
4.4.2 QUALITY OF THE OUTPATIENT DEPARTMENT  
4.5 TRANSFORMED MEASUREMENT SCALES  
4.6 DATA ANALYSES  

5. RESULTS  
5.1 EXPECTATIONS ABOUT DATA  
5.2 PREDICTORS OF PATIENT SATISFACTION  
5.3 OUTCOME-DIFFERENCES BETWEEN SCENARIOS  
5.4 OUTCOME-DIFFERENCES BETWEEN PATIENT GROUPS  

6. DISCUSSION  
6.1 RESEARCH QUESTIONS  
6.1.1 ANSWERING SUB-QUESTIONS  
6.1.2 ANSWERING THE RESEARCH QUESTION
6.2 LIMITATIONS
6.2.1 SAMPLE size 45
6.2.2 PARTICIPANTS AND SCENARIOS 45
6.2.3 MEASUREMENT SCALES 46
6.2.4 DATA ANALYSIS 47
6.3 CONTRIBUTION TO LITERATURE 47
6.4 RECOMMENDATIONS 49
6.4.1 GENERAL RECOMMENDATIONS 49
6.4.2 ALLOCATION PROCESS 49
6.4.3 INFORMATION AND COMMUNICATION 50
6.5 IMPLICATIONS FOR FURTHER RESEARCH 51
6.6 CONCLUSION 51

REFERENCES 53

APPENDIX 1
1. QUALITY INDICATORS PER FACTOR 1
2. RELATIONS BETWEEN BOTTLENECKS 6
3. PROBLEM STORIES 7
3.1 WAITING TIMES 7
3.2 MISTAKES 8
4. THREE RESEARCH TOPICS 9
4.1 OPTION 1: MULTIPLE DOCTORS 9
4.2 OPTION 2: RELATIONSHIP DOCTOR ASSISTANT 10
4.3 OPTION 3: ORGANIZATION CONSULTATION HOURS 11
5. QUESTIONNAIRE FOR PATIENTS 12
6. QUESTIONNAIRE FOR SPECIALISTS 16
7. ORIGINAL MEASUREMENT SCALES 17
# List of abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANCOVA</td>
<td>Analysis of covariance</td>
</tr>
<tr>
<td>EMR</td>
<td>Electronic medical record</td>
</tr>
<tr>
<td>EZ</td>
<td>Elisabeth hospital</td>
</tr>
<tr>
<td>GI</td>
<td>Gastro-intestinal (sub-specialty)</td>
</tr>
<tr>
<td>GP</td>
<td>General Practitioner</td>
</tr>
<tr>
<td>HCO</td>
<td>Healthcare Organization</td>
</tr>
<tr>
<td>IC(_{\text{patient}})</td>
<td>Informational continuity from the patient's perspective</td>
</tr>
<tr>
<td>IC(_{\text{specialist}})</td>
<td>Informational continuity from the specialist's perspective</td>
</tr>
<tr>
<td>IOM</td>
<td>Institute of Medicine</td>
</tr>
<tr>
<td>M</td>
<td>mean</td>
</tr>
<tr>
<td>MCMB</td>
<td>Partnership surgery Midden-Brabant</td>
</tr>
<tr>
<td>MC(_{\text{patient}})</td>
<td>Management continuity from the patient's perspective</td>
</tr>
<tr>
<td>MC(_{\text{specialist}})</td>
<td>Management continuity from the specialist's perspective</td>
</tr>
<tr>
<td>N</td>
<td>sample size</td>
</tr>
<tr>
<td>NCQ</td>
<td>Nijmegen Continuity Questionnaire</td>
</tr>
<tr>
<td>OD</td>
<td>Outpatient Department</td>
</tr>
<tr>
<td>PS</td>
<td>Patient Satisfaction</td>
</tr>
<tr>
<td>PSQ</td>
<td>Patient Satisfaction Questionnaire</td>
</tr>
<tr>
<td>RC(_{\text{patient}})</td>
<td>Relational continuity from the patient's perspective</td>
</tr>
<tr>
<td>SD</td>
<td>Standard Deviation</td>
</tr>
<tr>
<td>SQRT</td>
<td>Square root ((\sqrt{\cdot}))</td>
</tr>
<tr>
<td>TSZ</td>
<td>TweeSteden hospital</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1 OVERVIEW OF THE STUDY
This report presents the results of the master thesis graduation project performed at three outpatient departments (ODs) surgery in Tilburg and Waalwijk commissioned by the Partnership Surgery Midden-Brabant. The project can be divided into four phases, as can be seen in Figure 1.1: 1) literature review, 2) the pre-diagnosis and problem definition, 3) the analysis and diagnosis phase, and 4) a discussion and conclusion.

The request from the Partnership Surgery was to research the functioning of the three surgical outpatient departments and their quality. The first phase, the literature review, focused on this topic and discusses the available literature about quality of an OD. The literature review resulted in a quality framework, which can be used for quality assessment and improvement at Dutch outpatient departments.

The second phase in the project was defining a specific problem that could be analysed in the third phase. Quality proved to be a very broad concept; it was impossible to analyse all aspects of quality at three outpatient departments in the time frame of this graduation project. A pre diagnosis about the functioning of the ODs was made and encountered bottlenecks at the ODs were analysed as part of the initial problem analysis. These results were used to formulate a specific problem statement about one important bottleneck: patient-provider relationship. This final step of phase two required an additional literature review about continuity of care in order to derive a specific problem statement.

The final two phases of the research focused on answering the main research question of this report:

*How can consultation hours at the outpatient department be organized with respect to continuity of care, in order to improve the quality of the outpatient department?*

The data that was used to answer this research question was gathered and analysed in phase 3. Questionnaires for patients and specialists were used to collect the data. Results of the data analyses will be interpreted in phase 4, which consists of a conclusion and discussion, and the research question will be answered. To gain more insight into the organizational context of this research a concise description of the Partnership and both hospitals will be given in the next section.
1.2 Organizational context

This study was performed at the functionally organised outpatient departments surgery where the surgeons from the Partnership have consultations with patients. The specialty surgery in the Elisabeth-Tweesteden hospital includes multiple sub-specialties: bariatric, gastro-intestinal, trauma, vascular, and mamma. The focus will be on patients and employees from these sub-specialties within the ODs. Only patient appointments at this department will be considered and connections with other specialties or caregivers within or outside the hospitals will be disregarded.

Partnership Surgery Midden-Brabant

The specialist Partnerships surgery of the Elisabeth hospital (EZ) and the TweeSteden hospital (TSZ) merged into the Partnership Surgery Midden-Brabant (MCMB) in 2009. Working together has the advantage of establishing a stronger position compared to competitors and insurance companies. The total number of patients increased, which resulted in the opportunity to develop expertise and to excel in quality of care (Eclecta, 2006).

The Partnership consists of a large extent of relatively young specialists; the majority has an age between 35 and 45 years. This characterizes the Partnership in initiatives and ambition, but also in divergent wishes because of, for example, young families (e.g. a four-day workweek). Outpatient department employees noticed this change in composition of the Partnership: communicating with specialists became easier and the hierarchical gap between the two parties decreased.

After the merger of the Partnership the three outpatient departments will continue to exist until otherwise is decided. The care is still provided at the three locations but some care is centralized at one location. It is still the prerogative of the patient where he or she would like to receive treatment.

Outpatient department surgery Elisabeth hospital\(^2\)(EZ)

The EZ outpatient department (in Tilburg) team consists of 31 employees; nurses, doctor assistants, nurse specialists, etc. One team leader is managing the team and work at the OD. The team indicates that they are very close and communicate directly with other. The core of the team is very stable and has been working together for several years now.

In 2013, 54.128 appointments took place at this OD, including first and control appointments, and outpatient department surgeries. The majority of appointments for vascular patients are planned in the EZ.

Patient centeredness is the most important value for the outpatient department. The patient is central: “we should take care of the patient instead of a patient that should take care of himself.” In daily activities the mission of the hospital is pursued: lean, nice, quality, and safety. Every OD assistant would be able to recall these values and they are adopted via guidelines and procedures at the outpatient department.

---

1 The paragraph ‘Partnership Surgery midden-Brabant’ is based on an interview with the Partnership manager, May 19, 2014.
2 This paragraph is based on an interview with the team leader outpatient department EZ, June 12, 2014 and data received from the Business Controller.
Outpatient department surgery TweeSteden hospital

The TweeSteden hospital (TSZ) has two locations: Tilburg and Waalwijk. Both operate under one name, have one team leader and share one group of 30 outpatient department employees. The team at the poly in Waalwijk consists of four assistants who are mainly working at this location.

The OD in Waalwijk is functioning more and more as an outside clinic and care is moving towards Tilburg. Per day-part there is only room for one consultation hour in Waalwijk (compared to 3-5 in Tilburg). In 2013, 38,419 appointments took place at the TSZ outpatient departments. The OD in Tilburg is specialising in the treatment of patients with gastrointestinal problems.

According to the team leader the mission of the outpatient department surgery from the TweeSteden hospital can be formulated as: “Deliver the best possible care to the patient, pre-surgical as well as post-surgical, on the medical and the psychosocial level.” Patient-centeredness, discretion, safety, quality and efficiency are values associated with this mission. This is comparable to the mission of the EZ.

1.3 Report structure

The structure of this report is as follows. First, a concise summary of the literature review from phase one will be given in chapter two. In chapter three the process of defining the problem (phase two) will be explained. By means of Porras’ stream analysis method the bottlenecks retrieved from interviews with employees and surveys with patients are analysed. The result of this analysis is the stream diagnostic chart, which is used to formulate a relevant and feasible research question. Thereafter, the research method will be explained in chapter four. First, the research design and participants of the research will be clarified. Then, the procedure of administering the survey to patients and surgeons will be explained. The measures used in the questionnaire are discussed in order to complete the research method. Chapter five presents the results of the data analyses. These results will be used to answer the research questions of this research in chapter six. To conclude, limitations of the research, contributions to literature, practical recommendations and recommendations for further research will be given.

---

3 This paragraph is based on an interview with the team leader outpatient department TSZ, June 12, 2014 and data received from the Business Intelligence Analyst.
2. Theoretical background
This chapter includes a summary of the literature review. Firstly, a concise description about the functioning of an outpatient department (OD) in a hospital will be given. This description focuses on the functioning of an OD in general and is not directed to the specific ODs that will be analysed in this study. Secondly, the definition of quality of an OD and factors that contribute to the quality will be explained. In the process of analysing quality indicators that can measure the quality factors a specification of surgical ODs was made.

2.1 The outpatient department
An outpatient department (OD) delivers specialised outpatient care; patients receive care but do not need to stay overnight and are not admitted into the hospital. The main practice at the outpatient department is the consultation hours where patients have appointments with a specialist: appointments for a diagnosis, treatment, tests or a periodic check-up. Patients need a referral from their physician, or another specialist, before they can receive treatment at an outpatient department (Nederlandse Encyclopedie, 2014).

The majority of the medical specialists in the Netherlands are not employed by the hospital and are working in specialist Partnerships. Self-employed specialists in a Partnership have a financial interest in a high productivity and care volume per hour: their salary depends on their productivity. Salary, pension, and holidays are all part of the responsibility of self-employed specialists and they are financially responsible for their medical practice. Specialists employed by the hospital do not have a financial interest and their salary is restricted to national standards. Employed specialists have an employment contract with a hospital in which pension, salary, holidays, etc. are secured and the hospital is financially responsible for medical practice (Kok, Houkes, Tempelman, & Poort, 2010; Calkoen, 2010). The outpatient department is one of the places in the hospital where the specialists use the resources of the hospital and work with several employees of the hospital.

The function of an OD is to answer the care needs of a patient and to guide a patient in his treatment process. At the OD the specialist decides if the patient can be treated by him or a direct colleague, a specialist of another specialism, and how the treatment process will be organized. Typically, the actual treatment does not take place at the outpatient department, but for example in the operating room. However, several small procedures for which a patient does not need to be admitted into the hospital are done at the OD, e.g. injections, suture removal, or trimming of a mole.

After studying several outpatient departments it can be concluded that there is no single standard organization of an outpatient department. ODs in different hospitals and even ODs in one hospital can be, and often are, completely different. No generic literature is currently available about the organization and functioning of outpatient departments.

2.2 Quality
In this research quality of an outpatient department is defined as 'the degree to which the organization delivers high-quality care, has a staff orientation, and incorporates responsive governance; the organization focuses on the patients,
Continuity of care at an outpatient department. the community, and the employees’ (WHO, 2003; IOM, 2001). The World Health Organization (WHO) identified six dimensions of hospital quality that can be translated to an outpatient department and are used as the overarching dimensions for the quality framework: clinical effectiveness, efficiency, staff orientation, responsive governance, safety, and patient-centeredness (WHO, 2003).

Effectiveness and efficiency concern the appropriate and competent delivery of care and the optimal use of resources. The qualification and satisfaction of employees, learning opportunities, and working conditions are components of a staff orientation that should be given attention at the outpatient department. An organisation that meets the expectations of people (the community, patients, employees etcetera) incorporates responsive governance. The dimension safety does not only concern the safety of patients, but also that of the employees and environment. Last, the model states that the patient should be placed at the centre of the care the organisation delivers, i.e. patient centeredness.

Outpatient departments should take these six dimensions into account and try to excel on them in order to improve their quality. Sixteen factors that are related to quality were extracted from literature. Factors are elements that contribute to the quality of an organization (White and Griffith, 2010; Elsevier, 2013). A provisional categorisation of the quality dimensions and underlying factors can be seen in Table 2.1, this framework is not validated but will be used to create an overview of the used literature. Grey boxes indicate which factors contribute to which quality dimensions, which is derived from the explanation of the factors and performance indicators that measure them (IGZ, 2012; NIAZ, 2013; NVZ, 2014). For example, the shared values of a hospital are often based on the improvement of public health and focus on the community (e.g. ‘The provision of high quality and affordable healthcare with the keywords sweet, lean, quality and safety.’ (St. Elisabeth Ziekenhuis, 2012)). With this focus on society and patients the shared values will contribute to the responsive governance of a polyclinic. Another important aspect of a well-stated mission statement is the contribution to the motivation and inspiration of employees (Bart & Tabone, 2000). Hence, shared values will also contribute to the staff orientation of an outpatient department.

Table 2.1. The dimensions of quality and related factors for an outpatient department.

<table>
<thead>
<tr>
<th>Shared values</th>
<th>Empowerment</th>
<th>Communication</th>
<th>Service Excellence</th>
<th>Rewards</th>
<th>Evidence-based medicine</th>
<th>Improvement</th>
<th>Boundary spanning</th>
<th>Strategic protection</th>
<th>Administration</th>
<th>Treatment process</th>
<th>Communication (patient)</th>
<th>Information provision</th>
<th>Protocols</th>
<th>Waiting times</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Effectiveness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsive Governance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient centeredness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2.2.1 Quality factors
The sixteen quality factors were derived from an extensive literature search about quality of healthcare organizations, especially in the Netherlands. Three sources about quality of healthcare organizations and three sources about quality performance indicators were evaluated (White & Griffith, 2010; NIAZ, 2013; WHO, 2003; Elsevier, 2013; IGZ, 2012; NVZ, 2014). The first nine factors were found in the framework for excellence in healthcare organizations developed by White & Griffith (2010). White & Griffith identify essential characteristics of excellent healthcare organizations (HCOs): excellent organizations incorporate the delivery of high quality care, responsive governance, and a staff orientation. The characteristics are based on organizations that achieved high quality and were able to document this with objective data (among others, American hospitals that received a Quality award).

The final seven factors were retrieved from the Elsevier research about the best Dutch hospital (Elsevier, 2013). The indicators used in the research are selected from the indicator set of the IGZ and the legally required indicators from Zichtbare Zorg (ZiZo). In this research the indicators were evaluated and one-third was selected; several indicators were omitted to be able to compare all hospitals in the Netherlands. Elsevier tests the quality dimensions safety, patient-centeredness and clinical effectiveness.

All indicators and characteristics of OD quality found in the literature review could be categorised using these sixteen factors. The combination of quality characteristics from valued American hospitals and the national evaluation of Dutch hospitals was assessed as a representative quality framework and covered the six quality dimensions.

Excellence in healthcare organizations (White & Griffith, 2010)
The first element is shared values, which in healthcare should be focused on improvement of public health. With this focus on society and patients shared values will contribute to responsive governance of an outpatient department. Another important aspect of a well-stated mission statement is the contribution to the motivation and inspiration of employees (Bart & Tabone, 2000).

Empowerment describes people’s belief in their capabilities to mobilize motivation, cognitive resources, and course of action needed to exercise control over given events’ (Ozer & Bandura, 1990). This is a task of the team leader and can be increased when employees have access to resources, information, are supported, and have the opportunity for advancement (Kanter, 1977). Empowerment is focused on the employees and empowered employees work more effective (Menon, 1999).

The first factor communication concerns the communication between people working on the outpatient department. Communication towards patients will be mentioned hereafter. Communication includes listening, negotiating, teaching and training. Effective communication will not only influence the employees but also the processes: it will increase clinical effectiveness, efficiency, the safety of processes and teamwork between employees (Robinson, Gorman, Slimmer, & Yudkowsky, 2010).

Service excellence is a concept that employees of the hospital, or outpatient department, should pursue. When service excellence is reached the patient’s needs are met or even exceeded, which will result in satisfied patients.
The **reward system**, or better described as the recognition system, is a factor that influences motivation, satisfaction and self-confidence of the employees (Cronin & Becherer, 1999). To summarize; both factors have a clear employee focus.

The goal of **evidence-based medicine** is to provide protocols and guidelines that are used in the delivery of care, which are based on scientific knowledge (Rosenberg & Donald, 1995). Evidence-based medicine can improve clinical effectiveness and safety of care.

Continuous **improvement** in the healthcare is important, especially with the increasing pressure on costs and quality in this sector. Performance measurement is necessary to map the processes and investigate where possible improvements can be made. These improvements increase efficiency of the processes by reducing waste and eliminating costs. Improvements can also be made to decrease the number of mistakes or risks of procedures.

**Boundary spanning** includes maintaining relationships with external and internal stakeholders and mapping and processing community's needs. Boundary spanning can increase the responsive governance and the efficiency of the outpatient department.

The main focus of the last factor; **strategic protection**, safeguards the assets of the healthcare organization. The security programs and processes should be monitored systematically to ensure compliance. In a hospital multiple security programs are present, for example about information handling (patient records). Audits (internal and external) are one important step in the protection of the agency relationships. Structured programs are in place to evaluate processes and to deal with failures. Insuring that the employees are working according to the rules will improve safety as well as efficiency of processes.

**The best Dutch hospital (Elsevier, 2013)**

An up-to-date **administration** will ensure that the appropriate service is delivered, caregivers know everything the moment they need it, and mistakes are eliminated. Administrative processes are important to keep electronic medical records up-to-date. It could improve the efficiency, effectiveness, and safety of the outpatient department.

The factor **treatment process** indicates the structure or organisation of the treatment. The treatment process should be patient-centered; it is a response to the wishes of the patients. Treatment process can also improve the effectiveness and efficiency of the outpatient department.

The second **communication** factor is focused on the patient and especially includes the communication of results towards patients. In the **provision of information** it can be decided to take a patient-centred approach when the patient’s wishes and satisfaction are given high priority.

The developed evidence-based protocols need to be followed to ensure high quality care. The realization of evidence-based processes will result in higher clinical effectiveness and safety.

**Waiting times** are well known measure of the efficiency of the processes in hospitals. Waiting times include the access times for the OD and the waiting times in the waiting room.

Finally, the **outcomes of care** processes are a measurement for effectiveness and efficiency. The outcome measures can be used to assess the quality and appropriateness of the processes. Outcome measures could focus on
medical content outcomes of subjective outcomes. Two important outcome indicators for outpatient departments are patient satisfaction and employee satisfaction; both can be used to evaluate the quality of care (Jackson, Chamberlin, & Kroenke, 2001; Cleary & McNeil, 1988). The majority of medical content related outcomes are not applicable to the processes at an OD.

2.4 Conclusion
The developed framework describes the factors that influence quality of an outpatient department in a hospital. These factors can be used to guide or evaluate the quality improvement process of an OD. The factors can be measured using quality indicators: ‘measurable items of practice performance for which there is evidence or consensus that it can be used to assess the quality, and hence change in the quality, of care provided’ (Lawrence & Olesen, 1997).

The indicators from the quality standard (NIAZ) and the three sets of quality indicators (IGZ, NVZ, & Elsevier) are combined and analyzed in order to come to one set of indicators that is applicable to a surgical outpatient department. The specialization of an OD was taken into account in this selection process because it drastically influenced the number of indicators. The existing quality indicators are assigned to one of the factors that contribute to quality. In Appendix 1 an overview of the complete set of indicators that can be used to assess the quality of a surgical OD can be found. Again, this overview is used to categorize the Dutch quality indicators found in literature but is not validated.
3. Problem definition

This chapter describes the initial problem analysis that resulted in a problem statement and research questions for the second part of this study, which took place in the Elisabeth-Tweesteden hospital. The problem analysis was executed in order to map the problem context and decrease the problem mess. And to develop an interesting research question regarding a relevant bottleneck impacting the quality of the outpatient departments.

3.1 Initial problem analysis

In this chapter an initial problem analysis, which was performed in order to gain insight into the problems the outpatient departments are facing, will be explained. Porras’ stream analysis method was adopted to guide this process and to define the most significant bottlenecks the three outpatient departments are facing. In this chapter the stream analysis method will be explained and several steps in the process will be clarified. The bottlenecks used in Porras’ method were gathered through interviews with employees and a short survey among patients. Both data collection methods will be explained in paragraph 3.1.2.

3.1.1 Stream analysis method

The stream analysis method of Porras (1987) was used for the initial problem analysis. Stream analysis is a technique that guides the diagnosis of organizational problems. In the stream analysis method the problems are categorized into different organizational dimensions: the streams. In order to categorize the problems in the ‘correct’ stream a shared understanding about the problems is required.

The problems will be visualised into a stream diagnostic chart in which the several streams, problems and interconnections are visible (see Figure 3.1). Three types of problems can be identified: symptoms, problems, and core problems. The symptoms are caused by deeper problems and highly visible in the organization. Symptoms are driven by several other problems and thus are presented by a box with only arrows going in. Problems are more difficult to identify and are driving other problems in the organization: they have arrows going in and going out. A core problem can be seen as the root cause of all the problems in the organization: it is driving one or multiple other problems. The core problem has only outgoing arrows.

When visualizing the encountered problems with the stream analysis method possible themes of problems (i.e. sets of problems that cover some common issue) can be identified. Themes often require more integrated solutions in order to capture the whole problem.

Porras’ method was used to structure the bottlenecks found in the interviews with employees and a patient survey. After this categorization, interconnections that existed among the problems were identified. The identification of the streams and allocation of the problems to them was performed in consultation with the projects supervisor in order to reach this shared understanding. This stream diagnostic chart was used as input for the problem statement of this graduation project.
Continuity of care at an outpatient department.

Figure 3.1. Example stream diagnostic chart.

3.1.2 Data collection
Interviews with outpatient department employees and surgeons
The Critical Incident Technique (CIT; Flanagan, 1954) was used to structure the 11 interviews that were conducted with the aim to collect factors contributing to or decreasing the quality of outpatient departments. Flanagan (1954) defined a critical incident as ‘any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act’. In current research critical incidents were more broadly defined as the behaviour, activities, processes or factors that contributed to or decreased the quality of an OD.

The study was conducted at the surgical outpatient departments of the Elisabeth hospital and the Tweesteden hospital (with 2 locations: Tilburg and Waalwijk). Based on their availability three surgeons and six nurses were interviewed: two nurses from each OD were approached to ensure that information about the way of working at all three outpatient departments was collected. The team leaders from the two hospitals were interviewed as well. Taking into account the variety in the medical profession and the three different locations, this sample was considered representative for the outpatient department staff and Partnership.

The results of the structured interviews were analysed and a category framework was developed. In total 91 critical incidents were identified, of which 38 (42%) were positive/effective incidents and 53 (58%) were negative/ineffective incidents or bottlenecks. The incidents were identified by scanning the minutes of the interviews and marking all positive or negative incidents that were mentioned. The incidents described a specific incident with a positive or negative effect on the quality of the outpatient department. The meaning of the construct quality could be judged from the perspective of patient, OD assistant, or surgeon.

Survey for patients
Patient-centeredness is one of the dimensions of quality and patient satisfaction is an important outcome indicator. Therefore, the patient’s experience of the quality at an outpatient department is also important to consider when judging the quality from all points of view. A small sample (n=16) of patients in the
waiting rooms of the three ODs was asked to complete a short questionnaire consisting of four questions about quality aspects and patient centeredness of the outpatient department. This method provided a rough insight into the patient perception of quality and was not too time-consuming.

The results indicated that the patients were very positive about the staff: knowledgeable, friendly and calm assistants improved the quality and the patient centeredness of the outpatient department. On the other hand, the most important negative aspect was the waiting time.

3.1.3 Selection of bottlenecks

The extensive list of bottlenecks retrieved from the interviews and survey was evaluated in order to come to the final list of bottlenecks that was used in the stream analysis (see Table 3.1). In this list several bottlenecks from the initial list were combined. For example, the initial bottlenecks ‘bad communication due to different electronical medical records (EMRs)’, ‘not possible to prepare due to different EMRs’, and ‘due to different EMRs need for calls’ were combined into the underlying and common bottleneck 8: ‘extra work because of different EMR-systems’. Secondly, several bottlenecks from the initial list were omitted in consultation with the first supervisor. These deleted bottlenecks influenced only a very small percentage of the patients or employees. Two sets of bottlenecks were deleted as well: four bottlenecks about the architectural organisation of the outpatient department, and three bottlenecks that were indicated by one single patient.

Table 3.1. Final list of bottlenecks.

<table>
<thead>
<tr>
<th>Name bottleneck</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No structured communication between caregivers.</td>
<td></td>
</tr>
<tr>
<td>2. Disturbances in consultations.</td>
<td></td>
</tr>
<tr>
<td>3. Time-consuming and difficult communication.</td>
<td></td>
</tr>
<tr>
<td>4. Be behind schedule.</td>
<td></td>
</tr>
<tr>
<td>5. No structured day start.</td>
<td></td>
</tr>
<tr>
<td>6. Patients need to call for a control appointment.</td>
<td></td>
</tr>
<tr>
<td>7. No optimal task performance of assistant.</td>
<td></td>
</tr>
<tr>
<td>8. Extra work because of different EMR-systems.</td>
<td></td>
</tr>
<tr>
<td>10. Long waiting times.</td>
<td></td>
</tr>
<tr>
<td>11. Three locations.</td>
<td></td>
</tr>
<tr>
<td>12. No relationship Partnership – outpatient department.</td>
<td></td>
</tr>
<tr>
<td>14. Bad planning of patients in time slots.</td>
<td></td>
</tr>
<tr>
<td>15. Changes in planning require flexibility of patients.</td>
<td></td>
</tr>
<tr>
<td>16. Multiple doctors per patient.</td>
<td></td>
</tr>
<tr>
<td>17. Uncoordinated changes in treatment plan.</td>
<td></td>
</tr>
<tr>
<td>18. Tight schedule and no time available for preparation or delays.</td>
<td></td>
</tr>
<tr>
<td>19. No information when EMRs are down.</td>
<td></td>
</tr>
<tr>
<td>20. Discontinuity due to personal relationship assistant doctor.</td>
<td></td>
</tr>
<tr>
<td>21. A chaotic and variable planning.</td>
<td></td>
</tr>
<tr>
<td>22. Planning available a few weeks before.</td>
<td></td>
</tr>
<tr>
<td>23. No good administration in EMR from doctors.</td>
<td></td>
</tr>
<tr>
<td>24. Favourable tasks are omitted due to changes in locations.</td>
<td></td>
</tr>
<tr>
<td>25. Patients could forget to plan control appointment.</td>
<td></td>
</tr>
<tr>
<td>26. Extra time needed to check information EPD by assistants.</td>
<td></td>
</tr>
<tr>
<td>27. No update of waiting times.</td>
<td></td>
</tr>
<tr>
<td>28. Patients see problems between employees.</td>
<td></td>
</tr>
<tr>
<td>29. Capacity problems due to demand.</td>
<td></td>
</tr>
<tr>
<td>30. Planning problems.</td>
<td></td>
</tr>
<tr>
<td>31. Patient satisfaction</td>
<td></td>
</tr>
<tr>
<td>32. Employee satisfaction</td>
<td></td>
</tr>
<tr>
<td>33. Mistakes</td>
<td></td>
</tr>
</tbody>
</table>
Finally, five bottlenecks were added to the list retrieved from the interviews. These were derived from the original bottlenecks and were required to logically complete the interconnections. This created a complete set with all relevant relations between bottlenecks. The new bottleneck ‘Being behind schedule’ (4) was added in order to establish a link between several bottlenecks and the waiting times. A number of bottlenecks indirectly influenced the waiting times through this extra bottleneck. Furthermore, three outcome variables that proved to be important for the quality of an outpatient department were added: patient satisfaction (31), employee satisfaction (32), and number of mistakes (33) in order to complete the stream chart. The overarching cause of many problems the hospitals encountered, i.e. working at three locations (11), was added as well.

### 3.1.4 Bottleneck categorization

The selected bottlenecks were categorized into different organizational dimension: the streams. The process of grouping the bottlenecks resulted in five organizational dimensions. In order to achieve a shared understanding these five dimensions were verified with the first supervisor. The streams used for the stream chart were:

1. Outpatient department: This stream included the bottlenecks that applied to the OD-team: the internal or ‘behind the scenes’ organization.
2. Consultations: These bottlenecks were directly visible in the organisation and the execution of the consultation hours.
3. Support systems: This stream included the bottlenecks related to electronic patient records (EMRs), the planning, and the administration.
4. Patient effects: The bottlenecks in this dimension had a direct effect on the outpatient department patients; the patients experienced these bottlenecks.
5. Outcomes: The four outcome variables were: patient satisfaction, waiting times, employee satisfaction, and mistakes.

### 3.1.5 Stream chart

The first step in developing a stream diagnostic chart was establishing linkages between bottlenecks. A table with the cause-effect relationships could be seen in Appendix 2. The table displays the presence and direction of relationships between bottlenecks. The relationships were drawn based on the interviews and general expectations. The stream chart from Figure 3.2 displays these relationships between bottlenecks.

Based on the stream chart four core problems could be identified. The major core problem was working at three locations: this factor only has outgoing arrows and is a core problem as defined by Porras (1987). The other core problems (bottleneck 1, 16, and 22) were also the result of other problems, but because of the majority of outgoing arrows and the severity of their results these problems were called ‘core problems’ as well. Theoretically, bottleneck 5 and 30 are two core problems but because of their lack of significance and severity they remain ‘normal’ problems. Bottleneck 5 could easily be resolved when all outpatient departments implement a day start. Bottleneck 30 is a logistic planning problem and therefore out of scope for this research, but certainly important to consider in future research.
The symptoms are the four outcome variables in the chart. Waiting times was also labelled as a symptom because it is an important indicator of how well the processes at the outpatient department are working: waiting times should be minimized. The stream diagnostic chart could be seen in Figure 3.2.
3.1.6 Problem stories

When analysing the stream chart multiple problem stories could be identified. A problem story is a collection of connected problems that describes a more complex problem in the organization (Porras, 1987). The stories were formed by starting with a symptom and identifying which problems, and core problems, were causing it. This resulted in the process of 'reading backwards' or following arrows against the flow.

In the stream chart the four most important symptoms or outcomes were: patient satisfaction, waiting times, employee satisfaction, and mistakes. The problem stories for patient and employee satisfaction are given below, the other two can found in Appendix 3. These problem stories combined with the stream diagnostic chart provide insight into the most important problems at the ODs and guided the problem definition step.

**Patient satisfaction**

One of the most obvious and recognizable causes of a lower patient satisfaction is the waiting time (10) at the outpatient department. Not only the actual waiting time but also a lack of information about it (27) is decreasing the satisfaction. The ODs try to give patients regular updates about waiting times but because of delays in the planning (4) assistants who should update the patients are too busy with other tasks and forget to update the waiting time on the information board.

The presence of friction or discussion between caregivers (28), for example the doctor and outpatient department assistant, is another cause of decreased patient satisfaction. These problems between caregivers could arise because they have no structured way of communicating (1) and therefore it is possible that the surgeon and assistant do not understand each other. Another cause for friction could be the fact that not every relationship between doctor and assistant is equally good (20). This results in a discontinuity in the collaboration between doctors and assistants and requires a different way of communicating for every team. Because of the merger of the three hospitals (11) the group of surgeons became very large and the doctors were required to work at multiple locations. As a result of this the assistants need to work with more doctors and working in standard pairs is no longer possible. Both, the surgeon and assistant, need to constantly adjust their way of working and way of communicating to the person they are collaborating with.

Disturbances during a consult with the doctor (2) are another bottleneck that is decreasing the satisfaction. Doctors are working at multiple locations (11) and at the time they are having a consultation hour most of their direct colleagues have other tasks. Therefore, they have multiple tasks during their consultation hour at the OD: in addition to patient consults, they need to be available for questions from the ward, colleagues, and the doctors in training. Often, the specialist having a consultation hour is the only specialist available for questions; direct colleagues who are in surgery or have a day off cannot answer questions. There is also the possibility that they are called away for an emergency. Furthermore, the OD assistants could come to the specialists with questions (26) because the information in the EMR is not always sufficient (23). All these questions take time and disturb the consult with a patient.

Patients need to be flexible with appointments they have made for a consult or surgery (15). Because the planning is not known until a month before
(22) it is subject to change (21). The appointment a patient has made a few weeks ago could be changed or even cancelled because consultation hours could be changed or other surgeries could be more urgent. It is very frustrating for patients when this happens regularly.

Another cause for decreased patient satisfaction is the fact that patients often see multiple doctors during their treatment (16). Because of changes in the planning (21 & 22) appointments can be changed or consultation hours can be taken over by another surgeon. Furthermore, doctors are working at multiple locations (11) and therefore have very variable schedules for consultation hours (21). It is difficult to plan patients with one single doctor if they need to be seen regularly on short notice.

The final factor contributing to this outcome variable is change in treatment plan of a patient (17). It is very confusing for a patient when their treatment plan is adapted every time they visit the outpatient department. Patients often see multiple doctors (16) who all have their own way of working, so it is possible that every doctor adapts the treatment plan according to their knowledge and preferences. Besides, the lack of structured communication (1) and an insufficient administration in the EMR (23) result in difficult communication between caregivers (3). Sometimes the surgeon simply does not know what his colleague did last time and therefore is accidently changing the treatment of the patient.

**Employee satisfaction**
Multiple bottlenecks influence the satisfaction of the doctors and assistants. First, the disturbances during a consult with a patient (2) are not only decreasing the patient satisfaction but also the satisfaction of the doctor. Doctors are working at multiple locations (11) and thus there is the possibility that during the day part of a consultation hour that doctor is the only specialist present in the hospital. Therefore, he or she needs to be available for questions from the ward, colleagues, and the doctors in training during consultation hours. There is also the possibility that they are called away for an emergency. Furthermore, the outpatient department assistants could also come to them with questions (26) because information in the EMRs could be insufficient (23). All these questions take time and disturb the doctor’s consult; they are frequently distracted from their task treating patients.

Another bottleneck decreasing the doctors’ satisfaction is the administrative burden (9). This task requires a significant amount of time doctors rather spend on other tasks: the administration is an obligation they have to do because of legal reasons.

Taking over patients from colleagues (16) is not always desirable. Doctors often see patients they do not know and need extra time for these consults. It is possible that EMRs are not up to date (23) and the doctor needs to ask the patient general questions that were asked before; this could decrease the credibility of the doctor. It is also very difficult to establish personal relations and trust with patients that switch between specialists. Doctors can no longer work according to their routines and need to adapt to the situation, sometimes against their will. Because patients are seen by multiple doctors it is possible that the treatment plan is changed (17). When a doctor sees a patient the second time the treatment could be completely different than before. Because of the absence
of structured communication (1) between caregivers this could result in confusion, for doctors as well as for patients. It is possible that a colleague made a better decision or has more expertise about that patient, but it is difficult to communicate to a patient why changes are made to the original plan (3). Patients notice this confusion and miscommunication (28), which again decreases the credibility of a doctor and therefore the doctor’s satisfaction.

The assistant’s satisfaction could be influenced by the fact that specialties are shifting between the three locations (11), which in turn could result in a shift of desirable tasks (24). Furthermore, because the group of doctors is large the relation between the outpatient department team and Partnership has become very weak (12). The two groups are no longer communicating directly and team leaders do not have a contact person for questions or discussions. This results in difficult communication (3) between the two parties and could cause ambiguities or friction.

Both the assistants’ and doctors’ satisfactions are affected when waiting times increase (10) because they are behind schedule (4). The doctors and assistants feel pressure to work harder because waiting times are not desirable: these result in dissatisfied patients (31).

The planning is also a major cause for dissatisfaction of assistants and doctors. The planning is not known until a few weeks before the new planning horizon (22) and therefore it is subject to change. Employees cannot plan social activities because they do not know when they need to work at which location. Furthermore, the planning is very variable and chaotic (21), which means that employees cannot develop a routine.

3.1.7 Link to literature study
The four symptoms from the stream chart could be directly related to four quality dimensions from the literature study. Indicating that when the symptoms could be resolved, the quality of the polyclinic will increase. The quality framework with the six dimensions and sixteen quality factors is shown in Table 3.2. The checkmarks indicate which quality factors can be found in the stream chart.

The first symptom, patient satisfaction, is a variable that measures the dimension patient centeredness of a polyclinic. Patient satisfaction is an important outcome indicator for quality. Also the organisation of the treatment process influences the quality and can improve the patient centeredness of care. Bottleneck sixteen and seventeen are obstructing this aspect of the treatment process and indicate a significant area for improvement. Furthermore, the information provision and communication towards the patients are obstructed by these bottlenecks as well.

The waiting times are one of the sixteen quality factors from the literature study: they are a measure for the efficiency of the processes at the polyclinic. As can be derived from the problem story for the waiting times, multiple problems at the polyclinics are increasing the waiting times and thereby decreasing the quality. Especially problems with the planning and the absence of time for preparation and communication are contributing to delays in the consultation hours and thus the waiting times. Also the administration, which should be up to date but is very time-consuming, is a factor that is increasing the risk of delays.
Continuity of care at an outpatient department.

The third symptom, employee satisfaction, is an outcome measure for quality and could measure the staff orientation of the hospital. The quality factors contributing to the staff orientation of a polyclinic were not identified in the interviews with polyclinic employees. Empowerment, service excellence, and rewards, which appeared to be important factors the team leader could implement, proved to be irrelevant and non-existing at the polyclinics. However, internal communication proved to be a major bottleneck and is influencing the staff orientation as well.

Finally, mistakes could be related to the outcome indicator ‘appropriateness treatment’ that measures if patients receive good care and aftercare. Mistakes in or confusion about the treatment plan are decreasing this indicator, as well as the fact that patients could forget their control appointment. Mistakes are also a measurement for safety and clinical effectiveness, two of the quality dimensions.

Table 3.2. The relationship between the literature review and stream chart.

<table>
<thead>
<tr>
<th>Shared values</th>
<th>Clinical Effectiveness</th>
<th>Efficiency (2,5,11,13, 18,21)</th>
<th>Staff Orientation (20)</th>
<th>Responsive Governance</th>
<th>Safety</th>
<th>Patient centeredness (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X Empowerment</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>□(1,3)</td>
<td>□(1,3,20)</td>
<td>□(1)</td>
<td>□(26,33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X Service Excellence</td>
<td>□</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X Rewards</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based medicine</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement</td>
<td>□</td>
<td>□(23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary spanning</td>
<td>□</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic protection</td>
<td>□</td>
<td>□(9,23,26)</td>
<td>□</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administration</td>
<td>□(23)</td>
<td>□(21,33)</td>
<td>□</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication (patient)</td>
<td>□(16,23)</td>
<td>□(16,17,25)</td>
<td></td>
<td>□(1,16,17,28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information provision</td>
<td>□(6,15)</td>
<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocols</td>
<td>□(27)</td>
<td>□(6,15)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waiting times (10)</td>
<td>□(4,7,14,22, 30)</td>
<td>□</td>
<td>□</td>
<td>□(31)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The bottlenecks (see Table 3.1) are in brackets.

3.1.8 Conclusion

In all four problem stories one or multiple core problems are involved. The core problem ‘three locations’ is the basis for all other core problems but unfortunately impossible to change. The three hospitals will probably move to one location in the future, but first the other buildings need to be amortized. It was important that the problem that would be the focus of this research project could be researched and possibly influenced in the time frame of this project.

The stream chart and problem stories were discussed together with the hospital supervisor and the university supervisor to identify several research topics from which the subject for this research could be chosen.

Three possible research topics were extracted from the stream chart and problem stories:

1. Multiple doctors per patient: continuity of care.
2. The relationship between specialists and assistants: expectations.
3. The organization of the consultation hours: efficiency.

These topics needed to be evaluated with respect to feasibility (time and willingness to cooperate from participants) and theoretical substantiation in order to compose an appropriate problem statement. An elaboration of these three topics can be found in Appendix 4.
3.2 Problem statement

The evaluation process resulted in the choice for problem option one: multiple doctors per patient (bottleneck 16). This bottleneck can be analysed from three perspectives, which are indicated by the causes for and results of bottleneck 16: logistics (e.g. planning problems), information systems (e.g. administration and EMRs), and human resources (e.g. communication and satisfaction). It is a multidimensional problem and a balance between efficiency and satisfaction needs to be sought in solving this problem. The human aspect, which influences the quality of an OD (i.e. patient and employee satisfaction are two quality factors), matches the interests and expertise of the researcher.

This research could be based on literature about continuity of care and should be feasible within the timeframe of a master project. The theory of continuity of care will be used as the theoretical foundation when researching this bottleneck and optimizing the quality of the outpatient department. Furthermore, the willingness to cooperate from patients and specialists was estimated to be sufficient enough to be able to obtain a significant sample size. The other two research topics can give direction to future research.

Because changing the three locations or adapting the planning system are out of scope for this project, the focus of this research will be the continuity of care and how consultation hours should be organized in order to improve this aspect and therewith quality.

The first step in the process of defining the problem statement was a second literature review on the topic 'continuity of care'. The research questions will be based on this literature review.

3.2.1 Literature review continuity of care

As care became more specialized, the fragmentation of care increased: patients see different types of healthcare providers across organizations for different complaints (Reid, Haggerty, & McKendry, 2002). Continuity of care, one type of coordination of care, has developed an increasing interest by healthcare providers and researchers (Van Walraven, Oake, Jennings, & Forster, 2010). Continuity of care is recognized as one aspect that is essential to high-quality patient care (Starfield, Simborg, Johns, & Horn, 1977). According to Reid et al. (2002) continuity of care occurs when a patient experiences linked care over time or when discrete elements of care are connected. Continuity can only exist as an aspect of care that is experienced by an individual and that is received over time.

The experience of continuity differs for patients and healthcare providers. Patients experience continuity of care when they have the perception that the doctors know what their medical history is, that different doctors agree on one management plan for their treatment, and that a familiar doctor will continue the treatment in the future. On the other hand, healthcare providers experience continuity of care when they have adequate knowledge and information about a patient in order to deliver the best medical treatment and when they have the confidence that their opinion and medical procedures will be valued and pursued by colleagues (Haggerty et al., 2003).
Types of continuity
Reid et al. (2002) distinguish between three types of continuity, which often exist in parallel and have a different focus on the situation. Informational continuity is the availability and use of patient information about prior events (e.g. past visits, lab results, or referrals). The use of this information ensures the appropriateness of the current care for the individual. Information transfer and communication between care providers are essential for this type of continuity. Not only medical information, but also information about patient’s preferences, values and social context should be transferred and taken into account when treating a patient. This knowledge ensures that care is responsive to the patient’s needs and will result in higher satisfaction (Hjortdahl, 1992).

The second type of continuity is relational continuity, which recognizes that sustained contact between a patient and a doctor is a factor that connects the provided care over time. An on-going relationship between a doctor and patient improves the informational continuity (especially about the personal information) and causes, among others, trust, the doctor’s responsibility for the well being of the patient, and a mutual understanding. Relational continuity is also called provider continuity and has proved to be associated with improvements in care (Starfield, 1998). Patients do not prefer to repeat their story and preferences to several doctors and hence value a personal relationship with a doctor. The danger of seeing multiple doctors lies in the fact that patients need to start to supervise their own care and doctors need to ensure that treatment plans are shared and pursued by different doctors (Reid et al., 2002).

Management continuity is defined as a consistent and coherent approach to the management of a health condition that is responsive to a patient’s changing needs (Haggerty et al., 2003). It is important that different doctors over time complement each other and do not forget or repeat procedures. Management continuity focuses on the treatment of a patient and the consistency of the delivered care. Management plans should be made when patients are treated by multiple doctors and should be used to emphasize goals, treatment approaches and responsibilities. The coordination of care between multiple providers will result in experienced management continuity. Protocols or care pathways are good instruments to improve management continuity but flexibility is required to meet different needs and values per patient (Reid et al., 2002).

Hospital-based or specialized care often does not give priority to relational continuity of care. The continuity of care in these settings attach a high priority to quality of care, the quality of the team delivering the care and the consistency and coordination between different doctors. Management continuity is important in the way of defining a treatment plan for a patient and consistently following this plan with multiple doctors. Furthermore, in most healthcare organizations relational continuity is more difficult to achieve compared to informational or management continuity. Patients are often scheduled to meet with a doctor they have seen before but because of planning restrictions (e.g. absence, divided workload, expertise) this is not always possible. High relational continuity results in less flexibility in the planning of appointments of patients and could result in an uneven workload for doctors (Reid et al., 2002; Cowie, Morgan, White, & Gulliford, 2009; Van Walraven et al., 2010).
Advantages and disadvantages of continuity

Continuity of care has been indicated as an important aspect of quality of care (Starfield et al., 1977) and many articles focus on its positive effects. There is convincing evidence that continuity of care, in particular relational continuity, is related to several indicators of quality:

- Increased patient satisfaction (Saultz & Albedawi, 2004; Van Servellen, Fongwa, & Mockus D'Errico, 2006; Freeman & Hughes, 2010).
- Increased employee satisfaction (Freeman & Hughes, 2010; Haggerty et al., 2003).
- Fewer medical mistakes because of an increased willingness from the patient to accept medical advice and adherence, more medical and personal knowledge of patients, and reduced conflicts of responsibility between doctors (Servellen et al., 2006; Freeman & Hughes, 2010; Haggerty et al., 2003; Balint, 1957).

In addition, especially for relational continuity several disadvantages exist:

- Less efficient planning because workload cannot be shared, capacity could not be optimally utilized, and less flexibility with planning patients (Freeman, 1985).
- Not the best quality of care because the opinion of a ‘fresh’ doctor could improve the diagnosis or treatment (Broom, 2003; Freeman & Hughes, 2010).
- Higher costs because the utilization of available capacity is not maximized (Freeman & Hughes, 2010).

Conclusion

Fragmentation of care is a growing phenomenon in the healthcare sector; patients see several healthcare providers for different medical complaints. Because of the specialization of care this fragmentation is logical and will increase the quality of care because these caregivers have the best expertise. However, this fragmentation is not desirable in the treatment of one medical complaint because one specialist should have the required knowledge to treat the patient. Patients who visit an outpatient department for one medical problem should experience continuity of care because it will improve their satisfaction and hence the quality of the polyclinic. As explained before, there are several types of continuity and therefore polyclinics could undertake multiple actions in order to improve the continuity of care.

The experience of continuity of care and the relationship with quality will be the topic of the second phase of this graduation project. It will be investigated if patients perceive continuity in three different settings of consults. Furthermore, the quality of the polyclinic will be assessed based on several indicators found in the literature review and the relationship between continuity and quality will be explored. Based on these conclusions guidelines or recommendations for the organization of consults in order to improve the continuity of care and hence the quality of the polyclinic will be given.
3.2.2 Research questions
This problem definition and second literature review led to the following main research question:

How can the consultation hours at the outpatient department be organized, with respect to continuity of care, in order to improve the quality of the outpatient department?

To answer this research question three sub-questions were formulated. First, it is important to gain insight into the relationship between continuity of care and quality of the outpatient department. This led to the first sub-question.

Sub-question 1:
Is an increased experience of continuity of care related to an increased quality of the outpatient department?
   1a. For which type of continuity is the experienced continuity of care highest?
   1b. Do patients and doctors experience different levels of continuity of care?
   1c. For which scenario is the experienced quality highest?

Secondly, to improve the scheduling of patients more information about experienced quality from different patient groups is needed:

Sub-question 2:
Is there a difference in patient satisfaction between young and old patients for the three types of continuity?

Ad. 2.
Elderly patients desire a certain level of predictability of care, which can be achieved by providing relational continuity (Reid et al., 2002). It can be concluded that elderly patients are often in need of relationship continuity, where as younger patients do not prefer to be obliged to see one care provider (Freeman & Hughes, 2010).

Sub-question 3:
Is there a difference in patient satisfaction between chronic/complex patients and non-severe patients for the three types of continuity?

Ad. 3.
The more clinically complex the treatment of the patient becomes, the higher the probability that continuity of care is fundamental to achieve quality care. Furthermore, patients with chronic conditions often need to visit the hospital for the rest of their lives and therefore it is likely that the patient-provider relationship is more important (Servellen et al., 2006).
4. Research Method

This chapter describes the approach to this study; information about the research design, participants, procedure and used measures are included. To conclude, the performed data analyses with SPSS are explained in section 4.6.

4.1 Research design

In this cross-sectional study three groups of patients from three scenarios were compared:

- Scenario 1: Patients receive care for one medical complaint from multiple doctors.
- Scenario 2: Patients receive care for one medical complaint from one doctor.
- Scenario 3: Patients receive care for one medical complaint from multiple doctors but patients follow a pre-defined care path.

Random assignment of patients to these three groups was not possible because a patient’s medical history at the outpatient department and his or her medical complaint defined to which group they were assigned. However, the participants were randomly selected from the total group of patients from the two outpatient departments. Thereafter, selected patients were assigned to one of the three scenarios based on their medical history.

The best experiment would have a completely random assignment of patients to scenarios and scenarios that are completely independent (e.g. different doctors per scenario). A better control for the three types of continuity would be possible in that case, resulting in completely separate scenarios. In current research no interventions were done due to time constraints and undesirability; it would influence the care of patients and disrupt the work at the outpatient department.

It was assumed that the availability of information was similar within the three scenarios. Electronic medical records are used at both outpatient departments so there was assumed that medical information about patients was up-to-date and available during a consultation hour. Doctors vary in the amount of information they enter into the EMRs, but because patients from several sub-specialties and multiple surgeons were selected it was assumed that this would not lead to differences between the scenarios. However, doctors could differ in the uptake of this information and their memory about previous appointments. Furthermore, relational continuity automatically increases informational continuity because more knowledge is present in the specialist’s memory.

Patients from scenario 1 could only receive informational continuity of care when doctors used the information that was present. In scenario two relational continuity of care is present. In scenario three the patients encounter management continuity of care: patients receive care according to a ‘standard’ treatment plan that multiple doctors follow. Patients from scenario 1 and 2 were easily selected because the number of doctors each patient had been in contact with at the outpatient department could be counted in their medical records. In consultation with the hospital supervisor, patient groups that received treatment according to a standard care path or treatment plan were selected and patients from these groups were used as participants for scenario 3.
For every scenario patients from multiple sub-specialties and hence specialists were selected. For scenario 1 and 2 this resulted in a selection of patients from the three major sub-specialties: vascular, gastro-intestinal (GI) and trauma. For scenario three patients from three groups proved to be qualified: bariatric patients, breast cancer (mamma) patients, and trauma patients from the gypsum outpatient department.

Furthermore, participants were divided in one group with non-severe medical complaints and one group with chronic or complex conditions in order to answer research question 3. Non-severe complaints will be relatively simple and harmless but with a need for medical care. Chronic or complex patients often need control appointments for a longer period (e.g. five years) or have a very personal and emotional complaint. This distribution of patients in the non-severe or the chronic/complex group was made in consultation with the outpatient department assistants who facilitated the consultation hours that were included in this research.

4.2 Participants
The participants in this study were recruited from the outpatient department (OD): patients that visited the OD for an appointment with their specialist. To obtain a representative sample consultation hours from multiple specialists per sub-specialty were selected. As can be seen in Figure 4.1 and 4.2 the group of participants is distributed over the several sub-specialties and surgeons within surgery. Participation in this study was voluntarily, for both the participants and specialists. In order to minimize the burden for the specialist and to increase the diversity of the sample, a maximum of ten patients per consultation hour was set and specialists were approached only once. The total number of participants was 120 (53 from the EZ and 67 from the TSZ) divided over the consultation hours of 18 surgeons.

![Figure 4.1. Number of patients and specialists in sample per sub-specialty.](image1)

![Figure 4.2. Number of patients per scenario per specialist.](image2)
Information about the patients per consultation hour was gathered from the electronic medical records: age, sex, medical complaint, and the history with specialist(s) from the outpatient department. New patients were dropped because they did not yet have an experience with continuity of care at this outpatient department. To measure continuity of care the patients should at least have had one previous visit at the outpatient department, preferably at least two (21% of the participants had one previous visit, 79% 2 or more previous visits). Patients who had a bad news conversation were omitted for sensitivity and privacy reasons.

The information about the medical complaint was used to categorize the patients into the non-severe or chronic/complex category. 36.7% of the patients was categorized into the non-severe category and 63.3% was labelled chronic/complex in consultation with the OD-assistants. The majority of vascular, mamma, bariatric, and GI patients had a chronic condition. The average age of the sample (59.3 years, SD = 15.8) was higher than the average age at the outpatient department (which was 53.8 years at EZ and 50.2 at TSZ in 2013), presumably because children (age < 18) were omitted as participants. The majority (77.4%) of the vascular patients had an age above 55 years and also the average age of the GI patients was relatively high (64.5 years). Therefore, in order to divide the patients into two groups of comparable size the line of demarcation between young and elderly was set at the median age (61 years), which resulted in 60 ‘young’ patients and 60 ’old’ patients. The distribution of patients across the categories age, sex, scenario, and severity can be seen in Figure 4.3.

![Figure 4.3. Distribution of participants per age-group, scenario, sex and severity of complaint.](image)

In the analysis part of the data three scenarios will be compared to each other. Furthermore, within these three scenarios subgroups of patients (age, sex, severity of complaint) will be studied. The distribution of patients across the sub-groups within the three scenarios can be seen in Figure 4.4. These graphs were used to identify pre-existing differences among the three scenarios and will
be included in the analyses. Especially the graph from scenario 3 shows some notable distributions from patients over the subgroups. This can be explained by looking at the sub-specialties that are included in this scenario: bariatric, mamma, and gypsum. All mamma patients are female (10 of the 32 patients in scenario 3) and the majority of patients with obesity were female (14 of the 15 bariatric patients). Furthermore, bariatric patients are relatively young compared to other sub-specialties within surgery; their average age was 44.8 years (compared to 59.3 years in the full sample), resulting in a relatively young sample for scenario 3.

Figure 4.4. Distribution of participants per sub-group per scenario.

4.3 Procedure
The study included administering a questionnaire with both patients and specialists. The procedure of this study can be divided into three parts: the preparation for the data collection process at the outpatient departments, surveys at the outpatient department, and the categorisation of participants. These three phases will be explained in the following sections.

4.3.1 Preparation for data collection
Consultation hours that were investigated during the data collection process were selected from the general schedules of the surgeons. During one consultation hour the researcher would ask several patients of that specialist and the specialist him- or herself to fill in a questionnaire. The consultation hours were selected on the basis of two criteria:
- Multiple specialists per sub-specialty were to be selected.
- Only consultation hours that included at least five eligible (e.g. no new patients) were to be included, for reasons of efficiency.

The data collection period was spread over four weeks, which resulted in a large variety of patients and specialists (e.g. 18 different specialists). One week before the start of the data collection process a pilot study was conducted to test the
patients’ willingness to participate, their understanding of the questions, and the burden of filling in the questionnaire for specialists. Patients were found to be willing to participate and the surgeon did not experience answering the questions as a great burden.

After the selection of the consultation hours the schedule of patients per consultation hour was retrieved from the electronic medical records in both hospitals. The schedule of patients was obtained and the patients’ age, sex, medical complaint, and history with specialists at this outpatient department were registered. This information was used to select the patients for this study.

4.3.2 Administering the survey
During the data collection from one consultation hour the researcher was dressed in a white coat and therefore looked like a caregiver from the outpatient department. The patients of interest where called from the waiting room and asked to wait for the specialist in a treatment room. Thereafter, the patient was told that the hospital was investigating the quality of the outpatient department and consults and that the opinion of the patients was very important. They were asked whether they would like to participate in the research and would fill out a short survey after their appointment with the specialist (almost 95% agreed to participate). The written survey was administered anonymously. Patients were asked to return the questionnaire to the researcher or to give it to the receptionist at the front desk. The questionnaire for the patients can be found in Appendix 5.

When the patient agreed to participate in the research, the questionnaire for the specialist was put on his desk or given to him after the consult. The name from the patient of interest was written on the questionnaire to ensure that the specialist would answer the questions regarding the correct patient. The specialist’s questionnaire can be found in Appendix 6.

4.3.3 Categorizing the participants
The participants needed to be categorised into two categories: severity of their medical complaint and continuity scenario. The first categorisation was made in consultation with the outpatient department assistant. The categorisation into the three scenarios was done with the information about previous consults at the outpatient department that was available in the medical records. As explained before, all patients from bariatric, mamma-care, and the gypsum outpatient department were categorised into scenario 3 when they saw multiple specialists during their treatment. When these patients only saw one specialist they were categorised into scenario 2.

Patients from scenario 1 had seen multiple caregivers during their treatment. The following patients were categorised into scenario 1:
1. Patients who had seen more than one doctor in 2014 and no regular doctor could be identified.
2. Patients who had one regular doctor but who saw someone else in this consult (because the questionnaire covered this consult and this doctor). Patients who received treatment from their regular doctor in the majority of their visits were categorised into scenario 2. A regular doctor should be easily
Continuity of care at an outpatient department.

identified when investigating the patients’ medical records. This category included the following patients:

1. Chronic patients with one regular doctor (several years).
2. Relatively new patients who saw one doctor two or three times.
3. Patients who had seen one single doctor multiple times in 2014, but had seen others before that.

The numbers of patients in the subgroups from scenario 2 are shown in Table 4.1.

<table>
<thead>
<tr>
<th>Patients in scenario 2</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Regular doctor (chronic patients)</td>
<td>12</td>
</tr>
<tr>
<td>2. 2nd or 3rd appointment: same doctor every time</td>
<td>11</td>
</tr>
<tr>
<td>3. Last six months (&gt;3) appointments with one doctor, before 2014 other doctors</td>
<td>16</td>
</tr>
</tbody>
</table>

4.4 Measurement scales

The questionnaires for patients and specialists measured two constructs: continuity of care and quality of the outpatient department. Continuity of care was measured with three scales: relational continuity, informational continuity, and management continuity of care. Quality of the outpatient department was measured with scales for: patient satisfaction, specialist satisfaction, and extra time spent. In this section these measurement scales will be explained and the results of an exploratory factor analysis to assess the internal consistency of these scales will be provided. The measure employed to test internal consistency is the Cronbach Alpha, which should preferably be above 0.7 to indicate a reliable scale (Field, 2005). All original measurement scales can be found in Appendix 7 and correspond to the questionnaires (except for the patient satisfaction scale for which three items were deleted).

4.4.1 Continuity of care

Continuity of care was measured from two perspectives: the patient and the specialist. As stated in the literature review about continuity of care both groups experience continuity differently (Chapter 2.3). All three types of continuity of care were measured from the patient’s perspective. From the specialist’s perspective items measuring relational continuity of care were not included because it is not an aspect of the specialist’s experience of continuity (Haggerty et al., 2003). Familiarity with a doctor is only important from the patient’s perspective and is something the patients experience.

The patient’s perspective

The patient’s experience of continuity of care was measured using the Nijmegen Continuity Questionnaire (NCQ; Uijen, 2012). The NCQ is a generic questionnaire that measures patient’s experience of continuity of care, especially personal (relational) continuity and team and cross-boundary (management) continuity. The questionnaire can be used for patients across care settings and with different diseases.

The questionnaire includes eight items measuring relational continuity (RC_{patient}). Five of these items refer to the patient’s perception of the degree the specialist knows them (sample item: “This specialist knows my family
continuum of care at an outpatient department.

circumstances very well.”). Three items refer to the patient’s experienced commitment from the specialist (sample item: “This care provider maintains enough contact with me when I am seen by other care providers.”). To conclude, four items measuring management continuity \( MC_{patient} \) of care between different specialists are included (sample item: “The care given by these care providers is well-connected.”) (Uijen, 2012).

Items for measuring informational continuity \( IC_{patient} \) are not included in the NCQ, but were obtained from another source and adapted for this study. According to Reid et al. (2002) measures for information continuity included asking patients directly if their records were available at the time of the consult, if the specialist knew about previous consults, and if the treatment of complaints from previous consults was followed up. These questions measure the degree to which patients had the perception that the specialist was up-to-date about their medical history and that he was prepared for the consult. These direct questions were translated into three items measuring informational continuity (“This specialist was up-to-date about my medical complaints.”, “This specialist was up-to-date about the content of previous consults.”, and “Issues from previous consults were discussed again in this consult.”).

All questions were measured with a five-point Likert scale with options ranging from 'strongly disagree' to 'strongly agree'. The scale for relational continuity from the patient perspective \( RC_{patient} \) was calculated using all eight items from the questionnaire and had an excellent internal consistency of \( \alpha = .93 \). The scale for management continuity \( MC_{patient} \) included four items based on the NCQ, but due to multicollinearity problems item 1 ("These caregivers excellently transfer information to one another.") was deleted (Field, 2005). This resulted in a scale consisting of three items measuring \( MC_{patient} \) (\( \alpha = .92 \)). The last continuity scale from the patient perspective; informational continuity \( IC_{patient} \), included three items and had an internal consistency of \( .78 \). Hence, factor analysis indicated the presence of three separate continuity factors, but due to cross loadings this result was not decisive. Seven out of eight relational continuity items also loaded on factor 3 (informational continuity), and 2 out of three informational continuity items loaded on factor 1 (relational continuity). However, the loadings for the \( RC_{patient} \) items were highest for factor 1 (RC) and for the \( IC_{patient} \) items highest for factor 3.

**The specialist’s perspective**

No validated measurement scales for the experience of continuity of care from the provider’s perspective were found. Therefore, information about the measurement of informational and management continuity from Reid et al. (2002) was used to compose two sets of items. An important requirement for the specialist’s questionnaire was minimizing the time necessary to answer the questions. Specialists needed to fill in the questionnaire during their consultation hour, which resulted in an extra delay: this delay needed to be minimized in order to increase the willingness to participate.

Measures of informational continuity are generally divided into two types: items measuring the transfer of information between specialists and items measuring the uptake and use of this information by them (Reid et al., 2002). This definition of measurement scales was used to compose three items measuring informational continuity from the specialist’s perspective (“All
required medical information was available before the consult.”, “I used this medical information when making decisions during the consult.”, and “Personal information about the patient (e.g. personality, home situation, values) is included in the patient record.”).

The most frequently used method of measuring management continuity is reviewing how closely protocols or care pathways are followed by different care providers (Reid et al., 2002). Management continuity focuses on the consistency of care between several providers. This definition was translated into three items measuring the management continuity from the specialist’s perspective (“There is a standard treatment plan for this patient.”, “I did not change the original treatment plan from this patient”, and “Adjustments were made to the original treatment plan, which had an impact on the patient.”).

Both scales were measured on a five-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’. The scale for informational continuity (IC_{specialist}) had a Cronbach Alpha of 0.70. The scale for management continuity from the surgeon’s perspective (MC_{specialist}) had an internal consistency of $\alpha = 0.76$.

### 4.4.2 Quality of the Outpatient Department

The literature review identified six dimensions and sixteen factors of quality. Three of the four symptoms from the stream chart (Figure 3.2), hence three outcome indicators of quality, were measured with the questionnaires to determine a value for quality of the outpatient department: patient satisfaction, specialist satisfaction, and extra time spent. Quality was measured as the combined construct of these three individual outcome indicators.

**Patient satisfaction**

Patient satisfaction is an important outcome indicator for quality and reflects the patient-centeredness of the outpatient department. The Patient Satisfaction Questionnaire short-form (PSQ-18; Marshall & Hays, 1994) was used to measure this quality indicator. This questionnaire measures overall satisfaction with medical care and the satisfaction with six aspects of care: interpersonal qualities, technical quality, communication, financial aspects, the consult with the doctor and accessibility of care (see Appendix 7 for the full 18-item questionnaire). The PSQ-18 is the short version and could be used when time constraints hinder the use of the original 80-item version (Marshall & Hays, 1994). Because patients were asked to answer questions about continuity as well as quality there was decided to use the short questionnaire to increase the willingness of patients to cooperate.

Question five and seven from the PSQ-18 measure the satisfaction with financial aspects of the received care. These two questions were deleted from the PSQ because medical costs were not relevant due to the insurance scheme in the Netherlands. Question nine was deleted as well because it addressed the accessibility of emergency care: this care takes place in the emergency room of the hospital and is not relevant for the patients at the OD. The remaining fifteen items were measured on a five-point Likert scale ranging from ‘strongly disagree’ to ‘strongly agree’.

A factor analysis of the fifteen patient satisfaction items indicated three separate factors of which one factor explicitly included the three questions about
experienced access to care at the outpatient department (PS8, PS16, PS18). One of the other two factors included all reversed stated questions and the last one the remainder of the questions. Because no clear factor structures were found, it was decided to use the complete scale (15 items). However, effects from continuity of care on access of care were expected and therefore this aspect of patient satisfaction was also taken into account, despite the relatively low alpha ($\alpha = .58$). The reliability of the patient satisfaction scale was very good ($\alpha = .89$), so no questions were deleted.

**Specialist satisfaction**
Employee satisfaction is a second important outcome indicator. The type of employee satisfaction that is of interest in this research is the satisfaction of employees with their ability to perform optimally. This ability could be increased or decreased by the different types of continuity. Discontinuity of care has several disadvantages, which can be derived from the found advantages of continuity of care. Furthermore, three interviewed specialists also indicated several disadvantages of discontinuity of care, such as uncoordinated changes that were made to a treatment plan or explaining to a patient by they see multiple specialists. These disadvantages decrease the possibility of specialists to optimally treat patients, which is an important goal pursued by the outpatient department. An inability to treat a patient optimally could therefore decrease the satisfaction of the specialists.

Five disadvantages of discontinuity were extracted from the list of advantages of continuity and the three interviews and formulated as questionnaire items. These items measured the experience of the performance of the specialist. The items were measured on the same five-point Likert scale. A high score indicated lower satisfaction. Because of singularity problems (Field, 2005) (item 5), cross-loadings on each other (item 1 and 2) and cross loading on the factors for ICspecialist and MCspecialist, this measurement scale had to be removed from this research as it did not exclusively measure specialist satisfaction.

**Extra time spent**
The interviewed specialists indicated that they needed extra preparation and consultation time for patients they had not seen before. In general, this extra time results in less efficient consultation hours and increases the total waiting time for patients in the waiting room, the latter being one of the sixteen quality factors (Chapter 2.2).

The preparation time is mostly dependent on the specialist’s current knowledge about a patient. This knowledge will be lower when the specialist does not know the patient because a colleague treated him or her the last time. As there is no time for preparation of consults because of the tight schedule (bottleneck 18 in Figure 3.2). The extra preparation time needed when a specialist sees a new patient will decrease the efficiency of the consultation hours. The preparation time does not necessarily result in waiting times for patients (e.g. specialists could save time during a consult) but the time saved on preparation could be used to reduce the delay in the consultation hours during one day-part.

The extra preparation time or time for questions during a consult when a specialist does not know the patient was measured with one question measuring
Continuity of care at an outpatient department.

‘extra time spent’ (i.e. this extra time was needed to obtain the right knowledge about a patient in order to deliver an appropriate treatment). It was impossible to collect objective data or measurements about this extra time spent. Every doctor had a different preparation process (i.e. at home, in the morning, during consultation hours) and others did not prepare a consult but would ask more questions during the consult with a patient. It was also impossible to distinguish between ‘extra or unnessesary questions’ or ‘necessary questions’ that were asked to patients.

It was decided to delete this question for further analysis due to interpretation problems encountered during the data collection. No distinction between preparation time before (e.g. at home) or during consultation hours was made which resulted in different answers to this question. An accurate indication of extra time spent could not be inferred from the specialists’ answers.

To conclude, only patient satisfaction was used as outcome variable to measure quality of the outpatient department. Descriptive information about the six measurement scales can be found in Table 4.2.

<table>
<thead>
<tr>
<th>Table 3.2. Descriptive statistics measurement scales.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
</tr>
<tr>
<td>---------</td>
</tr>
<tr>
<td>RCpatient</td>
</tr>
<tr>
<td>MCpatient</td>
</tr>
<tr>
<td>ICpatient</td>
</tr>
<tr>
<td>MCSpecialist</td>
</tr>
<tr>
<td>ICspecialist</td>
</tr>
<tr>
<td>PS</td>
</tr>
<tr>
<td>Access</td>
</tr>
</tbody>
</table>

* = Normal distribution is assumed

4.5 Transformed measurement scales

The analyses that will be performed in this study are parametric tests (e.g. regression analysis, analysis of variance) and therefore the data should be normally distributed (Field, 2005). Kolmogorov-Smirnov (K-S) statistic and the Z-value of the skewness are two normality indicators. A normal distribution of data is assumed when the K-S statistic is non-significant (> .05) or the absolute Skewness value is smaller than 1.96 (indicated by an asterisk in Table 4.2).

Two transformations were performed in order to increase the normality of the distributions of the variables. Because all seven variables were negatively skewed the transformations needed to be executed using reflected items. This was done by using the transformations SQRT(6-X) and LG10(6-X), in which the six is derived from adding one to the maximum value of the variables (Field, 2005). As can be seen in Table 4.3, the square root transformation improves the normality of all continuity scales and satisfaction with access, but decreases the Kolmogorov-Smirnov value for patient satisfaction. Therefore, in the analyses the square root transformations of all continuity scales and access scale were used to meet the normality requirement and an untransformed scale for patient satisfaction was used. To increase readability of the reflected items they needed to be reversed back: in that case a high value for the transformed item...
corresponds to a high score for continuity. This reversing back was done by extracting the square root term from its maximum value plus one. The maximum value for the square root continuity measures is 2.2361 (\(\sqrt{6} - 1\)), reversed square root transformations are then: 3.2361 – SQRT(6 - variable) (Field, 2005).

Table 4.3. Normality statistics of transformed variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>SQRT Kolmogorov-Smirnov (P) value</th>
<th>Kolmogorov-Smirnov (Z) value</th>
<th>LOG Kolmogorov-Smirnov (P) value</th>
<th>Skewness (2) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCpatient</td>
<td>0.10*</td>
<td>-0.18*</td>
<td>0.003</td>
<td>-2.26</td>
</tr>
<tr>
<td>MCpatient</td>
<td>&lt;.001</td>
<td>-0.36*</td>
<td>&lt;.001</td>
<td>-2.18</td>
</tr>
<tr>
<td>ICpatient</td>
<td>&lt;.001</td>
<td>-0.12*</td>
<td>&lt;.001</td>
<td>-1.25*</td>
</tr>
<tr>
<td>MCspecialist</td>
<td>&lt;.001</td>
<td>0.14*</td>
<td>&lt;.001</td>
<td>-1.62*</td>
</tr>
<tr>
<td>ICspecialist</td>
<td>&lt;.001</td>
<td>-0.01*</td>
<td>&lt;.001</td>
<td>-2.33</td>
</tr>
<tr>
<td>PS</td>
<td>0.003</td>
<td>-0.64*</td>
<td>&lt;.001</td>
<td>-2.04</td>
</tr>
<tr>
<td>Access</td>
<td>&lt;.001</td>
<td>.48*</td>
<td>&lt;.001</td>
<td>-2.02</td>
</tr>
</tbody>
</table>

* = Normal distribution is assumed

In the remainder of this report the reversed square root transformed continuity measures will be meant when referring to continuity measures and satisfaction with access. This results in a more difficult readability of results compared to the untransformed items, but this is required for the data analyses due to the normality assumption. Scores will no longer range from one to five (instead, from 1 to 2.2361) and intervals between consecutive scores change. However, a high score on the transformed variables does indicate a high score on the untransformed continuity variables. Patient satisfaction will be untransformed and, hence, its minimum and maximum values correspond to the five-point Likert scale.

### 4.6 Data Analyses

Two types of data analyses have been used in order to answer the research questions: multiple regression analysis and analysis of covariance (ANCOVA). A multiple regression analysis was performed to investigate significant correlations in the correlation matrix between predictor variables and outcome variables. Predictor variables were continuity of care measures from the patient's perspective; patient satisfaction and satisfaction with access were outcome variables. A hierarchical regression was used to test the influence from control and predictor variables and interaction terms (i.e. moderator effects). This analysis was performed with data from all three scenarios.

Secondly, different types of analyses of covariance were performed to investigate the differences between scenarios and subgroups within scenarios. An independent ANCOVA was performed to search for significant differences in experienced continuity of care and outcome variables between the three scenarios. The single categorical predictor variable in this analysis was scenario. Covariates age, severity, and sex were added to control for these variables.

A factorial ANCOVA was used to investigate differences between subgroups within the three scenarios. As mentioned before, these subgroups were: young vs. old patients, non-severe vs. complex or chronic complaints, and
males vs. females. Both scenario and the subgroup variables were categorical predictor variables for patients’ experienced continuity of care and satisfaction (general and access). Two covariates were added to every analysis to control for effects of the other two sub-groups (e.g. in the analysis of the effect of severity on continuity the covariates age and sex will be added). In the next chapter the results of these analyses will be discussed.

Table 4.4 shows an overview of the used analyses per hypothesis.

Table 4.4. Overview of research questions and associated analyses.

<table>
<thead>
<tr>
<th>Research question</th>
<th>Analysis</th>
<th>Variables</th>
<th>Power of test*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Is an increased experience of continuity of care related to an increased quality of the outpatient department?</td>
<td>Regression analysis</td>
<td>Dependent variable: PS, PS access, MCpatient, ICpatient Control variables: age, sex, severity</td>
<td>&gt;.80</td>
</tr>
<tr>
<td>1a. For which type of continuity is the experienced continuity of care highest?</td>
<td>ANCOVA</td>
<td>Dependent variables: RCpatient, MCpatient, ICpatient Factor: scenario Covariates: age, severity, sex</td>
<td>.82</td>
</tr>
<tr>
<td>1b. Do patients and doctors experience different levels of continuity of care?</td>
<td>Compare correlations</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>1c. For which scenario is the experienced quality highest?</td>
<td>ANCOVA</td>
<td>Dependent variables: PS, PS access Factor: scenario Covariates: age, severity</td>
<td>.82</td>
</tr>
<tr>
<td>2. Is there a difference in patient satisfaction between young and old patients for the three types of continuity?</td>
<td>Factorial ANCOVA</td>
<td>Dependent variable: PS, PS access Factors: scenario &amp; age Covariates: severity &amp; sex</td>
<td>.67</td>
</tr>
<tr>
<td>3. Is there a difference in patient satisfaction between chronic/complex patients and non-severe patients for the three types of continuity?</td>
<td>Factorial ANCOVA</td>
<td>Dependent variable: PS, PS access Factors: scenario &amp; severity Covariates: age &amp; sex</td>
<td>.67</td>
</tr>
</tbody>
</table>

* This power indicates the ability to detect medium effects (effect size = .30 (Field, 2005)).
5. Results

In section 5.1 descriptive data will be provided for the variables, both across scenarios, and for the scenarios and subgroups of patients to check whether the expectations were correct. In section 5.2 the results of the regression analysis will be given. Thereafter, the results of the independent and factorial ANCOVAs will be presented in section 5.3 and 5.4. The results will be used to answer the research questions in chapter 6.

5.1 Expectations about data

In this paragraph descriptive data will be used to check whether expectations about relations between variables were correct. The research questions are based on these expectations, which were retrieved from literature. This chapter could be used to detect possible conflicts in the dataset.

The correlation matrix (Table 5.1) provides a first indication of the patterns relevant for the regression analysis. In this research continuity of care is a subjective measure because it measures the experience of patients and specialists. As can be seen in the correlation matrix only the patient’s experience of continuity correlates with patient satisfaction. It was unlikely that the specialist’s opinion would influence patient satisfaction, because it is a subjective measure from the patient’s perspective. This is confirmed in the correlation matrix with near-zero, non-significant correlations between MC_specialist and IC_patient with patient satisfaction. MC_patient and RC_patient most likely will turn out to be significant predictors for patient satisfaction. IC_patient has a significant correlation with satisfaction as well but IC and RC are highly correlated and therefore most likely only one of the two will be significant in regression analysis ($r = .58, p < .01$).

Table 5.1. Correlation matrix for study variables.

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>RC_patient</th>
<th>MC_patient</th>
<th>IC_patient</th>
<th>MC_specialist</th>
<th>IC_specialist</th>
<th>PS</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC_patient</td>
<td>3.19</td>
<td>0.89</td>
<td>(.93)</td>
<td>.40*</td>
<td>.58*</td>
<td>.04</td>
<td>.32*</td>
<td>.49*</td>
<td>.31*</td>
</tr>
<tr>
<td>MC_patient</td>
<td>3.97</td>
<td>0.71</td>
<td>(.92)</td>
<td>.44*</td>
<td>.05</td>
<td>.07</td>
<td>.62*</td>
<td>.42*</td>
<td></td>
</tr>
<tr>
<td>IC_patient</td>
<td>4.07</td>
<td>0.72</td>
<td>(.78)</td>
<td>.07</td>
<td>.27*</td>
<td>.44*</td>
<td>.31*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC_specialist</td>
<td>3.87</td>
<td>0.81</td>
<td>(.76)</td>
<td>.49*</td>
<td>-.06</td>
<td>-.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC_specialist</td>
<td>3.87</td>
<td>0.62</td>
<td>(.70)</td>
<td>.04</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PS</td>
<td>4.11</td>
<td>0.48</td>
<td>(.89)</td>
<td>.73*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>3.89</td>
<td>0.59</td>
<td>(.58)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.01 level (2-tailed).

Three scenarios with different patterns of continuity of care were composed in order to test differences between the three types of continuity. It was expected that scenario 2; patients have one doctor, would score best on experienced continuity of care and thereby on patient satisfaction. Scenario 1 (patients saw multiple doctors) should score the worst based on continuity of care literature. The question was if scenario 3 (use care pathways) could be a good alternative for scenario 2, or in other words, whether scenario 3 is significantly better than scenario 1. Scenario 3 should score highest on management continuity of care because this type of continuity was aimed for by the use of standard treatment plans for bariatric, mamma, and gypsum patients.
Furthermore, it was expected that satisfaction with access would be lowest in scenario 2 because patients could not be planned with other available specialists. An indication of the results is shown in Table 5.2, where the average scores for the six outcome indicators are given per scenario.

Table 5.2. Mean and standard deviation per (untransformed) variable per scenario.

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCpatient</td>
<td>2.79 (SD = .94)</td>
<td>3.68 (SD = .68)</td>
<td>3.17 (SD = .71)</td>
</tr>
<tr>
<td>MCpatient</td>
<td>3.82 (SD = .73)</td>
<td>4.09 (SD = .67)</td>
<td>4.05 (SD = .72)</td>
</tr>
<tr>
<td>ICpatient</td>
<td>3.85 (SD = .82)</td>
<td>4.28 (SD = .55)</td>
<td>4.14 (SD = .64)</td>
</tr>
<tr>
<td>MCspecialist</td>
<td>3.83 (SD = .69)</td>
<td>3.88 (SD = .80)</td>
<td>3.91 (SD = 1.02)</td>
</tr>
<tr>
<td>ICspecialist</td>
<td>3.76 (SD = .61)</td>
<td>4.08 (SD = .59)</td>
<td>3.77 (SD = .62)</td>
</tr>
<tr>
<td>Access</td>
<td>3.89 (SD = .59)</td>
<td>3.96 (SD = .64)</td>
<td>3.81 (SD = .55)</td>
</tr>
</tbody>
</table>

Finally, several differences in outcome variables between patient groups were expected: young vs. old patients and patients with non-severe vs. chronic/complex conditions. Older patient were expected to value continuity of care more than younger patients. Also, the older patients would be most satisfied in scenario 2. In addition, on the basis of previous research, patients with a chronic or complex condition would value relational continuity more that patients with a relatively simple complaint. Table 5.3 shows that, on average, older patients are most satisfied in scenario two where they received treatment from their regular doctor. Older patients appeared generally more satisfied than younger patients. Also the chronic/complex patients were most satisfied in scenario 2 but also appeared to exceed the non-severe patients in satisfaction for the other two scenarios.

Table 5.3. Mean and standard deviation for patient satisfaction.

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>3.92 (SD = .59)</td>
<td>4.12 (SD = .43)</td>
<td>4.07 (SD = .49)</td>
</tr>
<tr>
<td>Non-severe</td>
<td>4.07 (SD = .49)</td>
<td>4.29 (SD = .44)</td>
<td>4.03 (SD = .45)</td>
</tr>
<tr>
<td>Chronic/complex</td>
<td>4.08 (SD = .43)</td>
<td>4.23 (SD = .47)</td>
<td>4.19 (SD = .46)</td>
</tr>
</tbody>
</table>

Descriptive data in Tables 5.1, 5.2, and 5.3 suggest that data is largely consistent with the expectations on which the research questions were based. Patients experience more RC in scenario 2, the least RC, MC, and IC in scenario 1, and older patients and patients with chronic/complex complaints tend to be slightly more satisfied in scenario 2. The next two paragraphs will test these differences and relationships for statistical significance.

5.2 Predictors of patient satisfaction

Two multiple regression analyses were conducted to evaluate how well the continuity variables predicted patient satisfaction and experienced access of care, respectively. First, assumptions for multicollinearity and independent errors were verified using the correlation matrix (no correlations > 0.8/0.9), VIF values (no values > 1) and Durbin-Watson statistic (should be between 1 and 3) (Field, 2005). Both regression analyses met all assumptions.
The predictor variables in the first regression model were the three patient continuity variables (RC<sub>patient</sub>, MC<sub>patient</sub>, IC<sub>patient</sub>), while the criterion variable was patient satisfaction. Dummy variables were added to control for the effect of age, severity, sex, and sub-specialty. An exploratory regression analysis indicated that only age (old vs. young) came close to the significance level of .05 and therefore the other three variables were left out of further analyses.

Furthermore, a set of interaction effects (moderating relations) was added to the model: interactions between severity and RC<sub>patient</sub>, age and RC<sub>patient</sub>, and RC<sub>patient</sub> and MC<sub>patient</sub>. It was expected that older patients and patients with more complex or chronic conditions would appreciate relational continuity more. In addition, management continuity was expected to act as a moderator on the relation between relational continuity and patient satisfaction and access. When relational continuity is absent the negative effect on patient satisfaction is lower when management continuity is high.

A summary of the hierarchical regression analysis for patient satisfaction as a dependent variable is shown in Table 5.4. In model 1 the control variables were entered, from which all non-significant were omitted from model 2. In model 2 the main effects were included, and to conclude, in model 3 the interaction effects were added.

Indices to indicate relative weight of the individual predictors are presented with β. Although all correlations between the predictors and patient satisfaction were positive, only two predictors remain statistically significant in model 2 and 3 (p < .05). As can be concluded from the R²-values, age accounts for 4.5% of the variation in patient satisfaction. When all control variables, main effects, and interaction effects (see Model 3) were included, more than 45% of the variance in patient satisfaction could be explained. All three interaction effects proved to be non-significant as can be seen in Model 3. On the basis of these results it can be concluded that MC<sub>patient</sub> and RC<sub>patient</sub> are the only significant predictors of patient satisfaction.

Table 5.4. Summary of hierarchical regression analysis for variables predicting PS (N=115).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th></th>
<th></th>
<th>Model 2</th>
<th></th>
<th></th>
<th>Model 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>β</td>
<td>B</td>
<td>SE</td>
<td>β</td>
<td>B</td>
<td>SE</td>
</tr>
<tr>
<td>Age</td>
<td>.204</td>
<td>.088</td>
<td>.213*</td>
<td>.117</td>
<td>.068</td>
<td>.122</td>
<td>.102</td>
<td>.070</td>
</tr>
<tr>
<td>RC&lt;sub&gt;patient&lt;/sub&gt;</td>
<td>.403</td>
<td>.160</td>
<td>.223*</td>
<td>.487</td>
<td>.173</td>
<td>.270**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC&lt;sub&gt;patient&lt;/sub&gt;</td>
<td>.872</td>
<td>.151</td>
<td>.461**</td>
<td>.903</td>
<td>.159</td>
<td>.477**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC&lt;sub&gt;patient&lt;/sub&gt;</td>
<td>.206</td>
<td>.167</td>
<td>.111</td>
<td>.156</td>
<td>.173</td>
<td>.084</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC&lt;sub&gt;patient&lt;/sub&gt;*RC</td>
<td></td>
<td></td>
<td></td>
<td>-.365</td>
<td>.605</td>
<td>.053</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severity*RC</td>
<td></td>
<td></td>
<td></td>
<td>.008</td>
<td>.009</td>
<td>.065</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age*RC</td>
<td></td>
<td></td>
<td></td>
<td>.288</td>
<td>.313</td>
<td>.071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>.045</td>
<td>.467</td>
<td>.476</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔR²</td>
<td>.045*</td>
<td>.422**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>5.380*</td>
<td>24.110**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>1/113</td>
<td>4/110</td>
<td>7/107</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.05  ** p<.01  Note: Age: old = 1, young = 0

A second regression analysis was conducted to test the relation between the predictor variables and access of care at the outpatient department, which is one aspect of patient satisfaction. It was expected that relational continuity would have a negative relation with experienced access because patients could only make appointments with one doctor, and that on the other hand management
continuity would have a positive relation because there is more flexibility in the scheduling of appointments. This regression analysis was performed with the same variables as the first one. Results are shown in Table 5.5.

As in the first regression analysis, three of the four control variables were non-significant and therefore omitted from model 2 and 3. As can be concluded from model 3, almost 25% of the variance in satisfaction with access can be explained by this set of variables and effects. However, management continuity is the only significant predictor. This confirms the expectation that management continuity has a positive relation with experienced access. However, all other main and interaction effects proved to be non-significant.

Table 5.5. Summary of hierarchical regression analysis for variables predicting PS access (N=115)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
</tr>
<tr>
<td>Age</td>
<td>.073</td>
<td>.038</td>
<td>.179</td>
</tr>
<tr>
<td>RC patient</td>
<td>.085</td>
<td>.082</td>
<td>.111</td>
</tr>
<tr>
<td>IC patient</td>
<td>.254</td>
<td>.077</td>
<td>.316**</td>
</tr>
<tr>
<td>MC patient</td>
<td>.081</td>
<td>.086</td>
<td>.103</td>
</tr>
<tr>
<td>MC patient*RC</td>
<td>.205</td>
<td>.310</td>
<td>.070</td>
</tr>
<tr>
<td>Severity*RC</td>
<td>.132</td>
<td>.160</td>
<td>.076</td>
</tr>
<tr>
<td>Age*RC</td>
<td>.001</td>
<td>.005</td>
<td>.026</td>
</tr>
<tr>
<td>R²</td>
<td>.032</td>
<td>.221</td>
<td>.237</td>
</tr>
<tr>
<td>ΔR²</td>
<td>.032</td>
<td>.189**</td>
<td>.016</td>
</tr>
<tr>
<td>F</td>
<td>3.723</td>
<td>7.807**</td>
<td>4.745**</td>
</tr>
<tr>
<td>df</td>
<td>1/113</td>
<td>4/110</td>
<td>7/107</td>
</tr>
</tbody>
</table>

* p<.05  ** p<.01  Note: Age: old = 1, young = 0

5.3 Outcome-differences between scenarios

Analyses of covariance were conducted to compare the effect of three scenarios on the continuity of care and patient satisfaction variables. Table 5.6 shows the means per scenario and indicates on which outcome indicates the scenarios significantly differ. Three covariates were included in the analyses for patient’s variables (RC, IC, MC, PS, and access) to control for effects of these variables: age, sex, and severity. In the analysis for MC_specialist and IC_specialist only one covariate was included: severity, because the type of patient could influence the knowledge or presence of information of specialists.

Table 5.6. Output of ANCOVAs between scenarios.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>F-value</th>
<th>N = 47</th>
<th>Scenario 2</th>
<th>N = 39</th>
<th>Scenario 3</th>
<th>N = 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC patient</td>
<td>6.45**</td>
<td>1.47 (.27)</td>
<td>1.73 (.23)</td>
<td>1.57 (.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC patient</td>
<td>2.35</td>
<td>1.79 (.24)</td>
<td>1.88 (.25)</td>
<td>1.86 (.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC patient</td>
<td>2.04</td>
<td>1.80 (.29)</td>
<td>1.94 (.22)</td>
<td>1.89 (.24)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC specialist</td>
<td>.28</td>
<td>1.79 (.25)</td>
<td>1.81 (.28)</td>
<td>1.83 (.34)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IC specialist</td>
<td>2.50</td>
<td>1.76 (.20)</td>
<td>1.87 (.21)</td>
<td>1.75 (.19)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>.83</td>
<td>4.05 (.50)</td>
<td>4.22 (.46)</td>
<td>4.09 (.47)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>.13</td>
<td>1.80 (.21)</td>
<td>1.82 (.22)</td>
<td>1.76 (.18)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p<.05

a Post hoc comparison tests yielded statistically significant differences (p < .05) for scenario 1 and 2.
b Post hoc comparison tests yielded statistically significant differences (p = .05) for scenario 2 and 3.
c Covariate severity was significantly related to experienced continuity.
Continuity of care at an outpatient department.

**RC\textsubscript{patient}**

There was a significant effect of type of scenario on relational continuity from the patient’s perspective at $p < .05$ level for the three groups (F(2,110) = 6.45, $p < .05$). The post hoc comparisons indicated that the mean score for scenario 2 (M = 1.73, SD = .23) was significantly higher compared to scenario 1 (M = 1.47, SD = .27, $p < .05$) and scenario 3 (M = 1.57, SD = .21, $p < .05$). However, scenario 1 (multiple doctors) and 3 (care paths) did not differ significantly. The covariate severity was significantly related to the patient’s experienced relational continuity, F(1,110) = 16.57, $p < .001$.

**IC\textsubscript{patient}**

The covariate severity of complaint was significantly related to informational continuity from the patients perspective, F(1,109) = 4.75, $p < .05$.

**IC\textsubscript{specialist}**

The main effect of scenario on IC\textsubscript{specialist} was marginally significant, F(2,12) = 5.54, $p = .09$. Pairwise comparisons indicate a difference between scenario 2 (M = 1.87, SD = .21) and 3 (M = 1.75, SD = .19). The covariate severity of complaint was also significantly related to informational continuity from the specialist’s perspective, F(1,112) = 5.45, $p < .05$.

### 5.4 Outcome-differences between Patient Groups

3x2 factorial ANCOVAs were conducted to compare patient groups within the three scenarios: young versus old patients, and chronic/complex versus non-severe complaints. In every analysis two covariates were added to control for their effects: sex and severity, or sex and age. The results of 10 performed factorial analyses of covariance are presented in this chapter.

**Scenario + age → RC\textsubscript{patient}**

There was a significant main effect of the type of scenario on experienced relational continuity, F(2,108) = 4.78, $p < .05$. Post hoc comparisons using Gabriel’s test indicated that the mean score for scenario 2 (M = 1.73, SD = .23) was significantly higher compared to scenario 1 (M = 1.47, SD = .27) and scenario 3 (M = 1.57, SD = .21). However, scenario 1 (multiple doctors) and 3 (care paths) did not differ significantly. There was no main effect of age on relational continuity, F(1,108) = .11, $p = .74$ and no interaction effect between scenario and age on RC\textsubscript{patient} (F(2,108) = 1.90, $p = .16$). The covariate sex was non-significant (F(1,108) = .02, $p = .89$), but severity highly significant (F (1,108) = 17.58, $p < 0.001$).

**Scenario + severity → RC\textsubscript{patient}**

The 3x2 analysis of covariance yielded a main effect for the severity of a patient’s complaint, F(1,108) = 18.37, $p < .001$, such that experienced relational continuity was significantly higher for chronic/complex patients (M = 1.67, SD = .24) compared to the non-severe group (M = 1.43, SD = .24). Furthermore, there was a significant effect of scenario on relational continuity (F(2,108) = 4.71, $p < .05$) where scenario 2 differs significantly from 1 and 3. The interaction effect
between severity and scenario was non-significant (F(2,108) = .93, p = .40) and both covariates were non-significant as well (age F(1,108) = .00, p = .96, and sex (F(1,108) = .28, p = .60).

The interaction graph is shown in Figure 5.1 and shows that the effects for both groups are almost parallel. Chronic/complex patients experience more relational continuity in every scenario, which could be caused by their more long-term relationships and more frequent visits with doctors from this outpatient department.

![Image of Figure 5.1](image)

**Figure 5.1. Interaction plot severity*scenario for RCpatient.**

**Scenario + age → MCpatient**
No significant main and interaction effects were found in the 3x2 analysis of covariance for management continuity with the factors age and scenario, and sex and severity as covariates. The main effects of age and scenario were: age (F(1,108) = 2.00, p = .16) and scenario (F(2,108) = 1.40 , p = .25). The interaction effect was non-significant (F (2,108) = .57, p = .57) and both covariates (sex (F(1,108) = 2.09, p = .15), severity (F(1,108) = .41, p = .53) as well.

**Scenario + severity → MCpatient**
The second analysis for management continuity also resulted in five non-significant effects. The main effects of scenario (F (2,108) = 1.54, p = .22) and severity (F(1,108) = .20, p = .66) and the interaction effect of scenario and severity (F(2,108) = .54, p = .58) all were non-significant. The covariates sex (F(1,108) = 2.15, p = .15) and age (F(1,108) = 1.45, p = .23) were non-significant as well.

It was expected that scenario 3 would score highest on management continuity but this was not confirmed. This can be explained by the fact that the questions for MCpatient were not being relevant or suitable for scenario 2. In that case no communication and information transfer between surgeons is necessary because patients have one regular doctor who has all the knowledge. Patients may have answered these questions positively instead of neutrally.

**Scenario + age → ICpatient**
There were no main effects from scenario (F(2,107) = 1.57, p = .21) and age on informational continuity (F(1,107) = .21, p = .65). The interaction effect of scenario and age group was non-significant as well (F(2,107) = 1.11, p = .33). The
Continuity of care at an outpatient department.

covariate severity was significant (F(1,107) = 5.35, p < .05), but sex was not (F(1,107) = 1.96, p = .16).

**Scenario + severity → ICpatient**
The 3x2 analysis of covariance yielded a significant main effect for the severity of a patient’s complaint, F(1,107) = 4.70, p < .05, such that chronic/complex patients experienced more informational continuity (M = 1.92, SD = .25) than non-severe patients (M = 1.78, SD = .26). The main effect of scenario was marginally significant, F(2,107) = 2.53, p = .08. Furthermore, the interaction effect, F(2,107) = .63, p = .53, and both covariates (age: F(1,107) = .73, p = .40, and sex: F(1,107) = 1.59, p = .21) were non-significant.

As can be seen in the interaction plot, chronic/complex patients experience more informational continuity. This was expected because chronic patients often already had multiple visits at this outpatient department, and thereby multiple doctors probably know their complaints. Characteristics for these chronic conditions are often standard and known to specialists. The majority of chronic patients had a regular control appointment at the OD in which the patient needs to give an update about his or her health and the long medical history of the patient is known to the doctor.

**Figure 5.2. Interaction plot severity*scenario for ICpatient.**

**Scenario + age → patient satisfaction**
No significant main and interaction effects were found in the analysis of covariance for patient satisfaction with the three scenarios and two age groups: scenario (F(2,108) = .60, p = .55), age (F(1,108) = 2.50, p = .12), and the interaction effect (F(2,108) = .36, p = .70). However, there was a marginally significant effect of covariate sex on patient satisfaction (F(1,108) = 3.00, p = .09), and a non-significant effect for severity (F(1,108) = .71, p = .40).

**Scenario + severity → patient satisfaction**
The main effects of scenario (F(2,108) = 1.21, p = .30) and severity (F(1,108) = 1.08, p = .16) and the interaction effect of scenario and severity (F(2,108) = .83, p = .44) all were non-significant. For the covariate age there was a marginally significant effect (F(1,108) = 3.22, p = .08), but sex was non-significant (F(1,108) = 1.96, p = .16).
Continuity of care at an outpatient department.

Figure 5.3 shows the interaction graph for age and scenario. The main effect for age was non-significant, but when age was entered as a covariate the effect became marginally significant. It can be concluded that older patients tend to be more satisfied than younger patients. The high satisfaction of older patients in scenario 2 matches the expectation on which research question 2 was formulated.

![Figure 5.3. Interaction plot age*scenario for patient satisfaction.](image)

**Scenario + sex → patient satisfaction**

The main effect of sex on patient satisfaction proved to be significant: $F(1,108) = 4.60, p < .05$: females were more satisfied than males. The effect of scenario was non-significant ($F(2,108) = 1.51, p = .23$) as was the interaction effect of scenario and age ($F(2, 108) = 1.33, p = .27$). Both covariates were non-significant as well: age ($F(1,108) = 2.37, p = .13$), and severity($F(1,108) = .34, p = .56$).

Females tend to be slightly more satisfied than males, as can be seen in Figure 5.4. Satisfaction is comparable in scenario 1 and 2, but differs in scenario 3. This can be explained by looking at the patient characteristics of scenario 3 (Figure 4.4): only four men were included in this group. The lower satisfaction score was a result of 2 less satisfied (score < 3), who decreased the average males satisfaction score.

![Figure 5.4. Interaction plot sex*scenario for patient satisfaction.](image)
Continuity of care at an outpatient department.

**Scenario + age → satisfaction with access**
There were no main effects of scenario (F(2, 108) = .07, p = .93) and age (F(1, 108) = 2.39, p = .13) on the satisfaction with access. The interaction effect (F(2, 108) = .59, p = .56) and both covariates were non-significant (sex: (F(1,108) = .00, p = .99), and severity (F(1,108) = .04, p = .85) as well.

**Scenario + severity → satisfaction with access**
No significant effects between satisfaction with access and severity of complaint or scenario were found. The two main effects were highly non-significant: scenario (F(2,108) = .29, p = .75), and severity (F(1,108) = .04, p = .84). The interaction effect of severity and scenario proved to be non-significant, F(2,108) = .23, p = .80, and both covariates were non-significant as well (sex: F(1,108) = .03, p = .86), age: (F(1,108) = 2.70, p = .10)).

The significant effects of the Factorial (3x2) ANCOVAs can be seen in Table 5.7.

Table 5.7. Results 3x2 analyses of covariance.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Predictors</th>
<th>Scenario</th>
<th>Age</th>
<th>Scenario x age</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCpatient</td>
<td>2 &gt; 1,3</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MCpatient</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ICpatient</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Predictors</th>
<th>Scenario</th>
<th>Severity</th>
<th>Scenario x severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCpatient</td>
<td>2 &gt; 1,3</td>
<td>CC &gt; N-S</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>MCpatient</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ICpatient</td>
<td>±</td>
<td>CC &gt; N-S</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Access</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

CC = chronic/complex patients, N-S = non-severe patients
± = Marginally significant effect, with 2 > 1, 3.
- = No significant effect.
Continuity of care at an outpatient department.

6. Discussion

In the first part of this chapter results from Chapter 5 will be used to answer the research questions from this study. Secondly, the limitations of this research will be explained in section 6.2. Thereafter, characteristics of the study that contribute to continuity of care research will be discussed. Practical recommendations for the hospital and theoretical implications will be given in sections 6.4 and 6.5. This chapter will be concluded with a conclusion where the strengths of this study will be presented.

6.1 Research questions

6.1.1 Answering sub-questions

1a. For which type of continuity is the experienced continuity of care highest?

This question can be answered by interpreting the results from the analysis of covariance from section 5.3. The only significant difference between scenarios that was found was for relational continuity. Patients in scenario 2 experienced significantly more relational continuity compared to scenario 1 and 3. Both MC\textsubscript{patient} and IC\textsubscript{patient} did not significantly differ per scenario so seeing one regular doctor is only associated with higher relational continuity.

1b. Do patients and doctors experience different levels of continuity of care?

Because the questions measuring management and informational continuity differed for patients and specialists scores cannot be compared one-to-one. Furthermore, 116 patients and 18 specialists participated, which means that patients are embedded within specialists: one specialist treated multiple patients (varying from 4 to 10 patients per individual specialist).

One way to compare experienced levels of continuity of care is to look at the correlation matrix from Table 5.1. MC\textsubscript{patient} and MC\textsubscript{specialist} did not correlate significantly ($r = .05$); indicating that there is no relationship between experienced management continuity of care for patients and specialists. On the other hand, IC\textsubscript{patient} and IC\textsubscript{specialist} were significantly correlated ($r = .27$, $p < .01$) indicating a weak relation between patients’ and specialists’ perceptions of informational continuity.

1c. For which scenario is the experienced quality highest?

Originally, quality was measured as a combination of patient satisfaction, satisfaction with performance and extra preparation time. As explained in Chapter 4, the last two measures had to be omitted for further research. Therefore, the term quality in this question should be replaced with patient satisfaction.

When comparing the average scores for patient satisfaction per scenario (see Table 5.3) it appears that patients in scenario 2 ($M = 4.22$) tend to be relatively more satisfied than patients in scenario 1 ($M = 4.04$) and 3 ($M = 4.09$). However, these small differences proved to be non-significant and it cannot be concluded that different scenarios are associated with different levels of patient satisfaction.
1. Is an increased experience of continuity of care related to an increased quality of the outpatient department?

Increased experience of continuity of care contributes to patient satisfaction and thereby quality of the outpatient department (see summary of the literature review). Results from Chapter 5.2 indicate that experienced management and relational continuity of care account for more circa 40% of the variance in patient satisfaction. Therefore, increasing the continuity of care at the outpatient department will significantly increase patient satisfaction and thereby quality.

A 40 per cent variance can be considered high given that other variables influencing patient satisfaction (i.e. friendliness staff, waiting time, accessibility OD) are not accounted for in this regression equation (Hallowell, 1996). Research into predictors of satisfaction often reaches R squared values with a maximum of 50% (Visser, Smets, Oort, & de Haes, 2003; Sixma, Spreeuwenberg, & van der Pasch, 1998; Yoon & Uysal, 2005). However, more insight into other predictors of patient satisfaction is needed to determine the relative importance of continuity of care.

2. Is there a difference in patient satisfaction between young and old patients for the three types of continuity?

There was a marginally significant ($p = .09$) difference between patient satisfaction of young and old patients: older patients tend to be more satisfied, as can be seen in the interaction plot (Figure 5.3). As this difference does not meet the formal cut-off score for significance ($p < .05$), this result should be interpreted with caution. No differences between the scenarios were found.

3. Is there a difference in patient satisfaction between chronic/complex patients and non-severe patients for the three types of continuity?

Comparing satisfaction of chronic/complex and non-severe patients per scenario indicated a non-significant difference. The expected difference was not found within this sample so no conclusive answer can be given to this question. However, chronic/complex patients experienced more relational and informational continuity, as can be seen in Table 5.7.

6.1.2 Answering the research question

How can the consultation hours at the outpatient department be organized, with respect to continuity of care, in order to improve the quality of the outpatient department?

Although literature predicted differences between the three scenarios and averages indicated multiple differences, this research did not yield significant differences. Patient satisfaction does not differ significantly per scenario, so it could be stated that the differences in continuity of care do not influence the quality of the outpatient department.

The distribution of patients in subgroups per scenario (see Figure 4.4) seems to indicate that an effective allocation process of patients is already used at the ODs: the majority of chronic/complex patients are found in scenario 2 and 3. Optimizing this process, for patients as well as surgeons, might increase patient satisfaction and employee satisfaction and thereby the quality of the outpatient department. An elaboration of this aspect will be given in section 6.4.
6.2 LIMITATIONS
Limitations of this study are related to the sample size, participants, measurement scales and the analyses.

6.2.1 SAMPLE SIZE
First, the sample size in this research was quite small for the number of variables that was included in the analyses, with limited statistical power (i.e. the probability of detecting actual effects) for some of the analyses. For the regression analysis the sample size was large enough to detect small effects (power > .80). However, this was not the case for the one-way and factorial ANCOVAs: the required sample size to detect medium (effect size = .30) or small (effect size = .10) effects lies between 111 and 967 participants when comparing the scenarios, and between 149 and 1289 when comparing patient groups within scenarios. The achieved power of the current comparison of scenarios was between .14 and .82 (for small or medium effects) and between .10 and .67 for small and medium effects in the comparison of patient groups within scenarios. These powers indicate that it was unlikely to find significant effects of the variables with this sample size in case the actual effects were small (e.g. the effect size of scenario on patient satisfaction was .02 and on RC_{patient} .11).

A second issue regarding the sample size is the unequal distribution of patients across the scenarios and patient groups. There are almost twice as many patients in scenario 1 as in scenario 3 and scenario 1 has much larger percentages of non-severe (60% vs. 24%) and old (54% vs. 21%) patients than scenario 3. This makes it difficult to distinguish the effect of severity of complaint and age from the effect of scenario (Karen, 2014).

6.2.2 PARTICIPANTS AND SCENARIOS
A second set of limitations involves characteristics of participants and the composition of scenarios. Firstly, all patients were highly satisfied (M = 4.11, SD = .48, on a 5-point scale), which makes it difficult to detect differences between scenarios and patient groups. The standard deviation measures the amount of variation from the average; therefore, a small standard deviation indicates that all values tend to be very close to the mean (Field, 2005). Temmink et al. (2000) confirm that post-measurement satisfaction questionnaires often produce highly skewed scores: more than 90% of the participants are satisfied. This difficulty could be overcome by comparing needs and expectations (pre-test) with patient experiences (e.g. satisfaction) (post-test).

Secondly, participants were relatively old compared to the average age of patients at both outpatient departments: 59.3 years versus 53.8 at EZ and 50.2 at TSZ. The used division between old and young patients may not be representative for the outpatient department patients. In literature, patients with an age above 65 (Reid et al, 2002; Bayliss, Edwards, Steiner, & Main, 2008) are often defined as older patients. In this study patients with an age above 61 were defined as older, therefore this difference could have influenced the effect of ‘age’ on continuity of care in the analyses.

A third limitation concerning patients is the distribution of sub-specialties over the three scenarios. Scenario 1 and 2 included vascular, GI, and trauma patients, but scenario 3 included patients from three other sub-specialties. This
difference could be an influence on patient’s experience of continuity and satisfaction and thus could have impeded the comparison of all three scenarios.

Furthermore, not all patients from scenario 2 had one regular doctor for 100% of their visits. Multiple types of patients were included in scenario 2, as is shown in Table 4.1. It was not feasible, due to time constraints, to only select patients with one doctor at every previous visit because this group was very small. Patient group 3 from scenario 2 (see Table 4.1) saw one doctor in four or more visits this year and therefore was placed in scenario 2, but could have been placed in 1 before 2014. By this less strict selection of patients for scenario 2 a grey area between scenario 1 and 2 was originated, which could have resulted in less clear differences between both. However, no overlap between both scenarios existed.

Finally a selection threat (Ary, Jacobs, Sorensen, & Walker, 2013) for the distribution of patients over scenarios was in place, see Figure 4.4. The majority of non-severe patients can be found in scenario 1 and the more complex or chronic patients in 2 and 3. It seems that an allocation procedure is already in place at the outpatient department: patients are placed with one or multiple doctors because of their medical history. Dependence between scenario and type of patient exists and therefore, the selection of patients was not completely random.

6.2.3 MEASUREMENT SCALES

The third group of limitations refers to the used measurement scales. Two measurement scales that were included in the questionnaires were omitted from analyses: satisfaction with performance and extra time spent. As a result, quality was only measured using one factor: patient satisfaction. Patient satisfaction is related to quality of an outpatient department but it is unknown how much it contributes to quality. Thereby it is difficult to draw general conclusions about the relationship between continuity of care and quality of an outpatient department.

Furthermore, different scales for experienced continuity for patients and specialist were used, which made it impossible to compare these values one-to-one. No definite answer could be given to research question 1b.

Thirdly, the measure for MC\text{patient} was not being relevant or suitable for scenario 2. The measure encloses communication and collaboration between multiple specialists, which were not important in scenario 2 and thus could not be correctly measured in this group. Therefore, it was difficult to compare all three scenarios because only RC\text{patient} was correctly measured in all three.

A few patients from scenario 2 indicated that they did not know how to answer the questions about management continuity because these were not applicable in their situation. Thereby, patients answered with ‘neutral (3)’, with ‘very agree (5)’ or did not answer these questions. This aspect is consistent with the third limitation regarding measurement scales. Perhaps the addition of a ‘not applicable’-option to these few questions was more unequivocal than leaving the choice to patients how to answer the question. However, this option will increase the amount of missing data, which is undesirable.
6.2.4 Data analysis

In order to be allowed to use parametric tests one’s data should be normally distributed. Finding the best transformation for all forty separate items was very difficult; instead the seven factors were used. It was assumed that the normality requirement was met when the Skewness scores were acceptable. However, Kolmogorov-Smirnov statistics for all variables, except RCpatient, remained significant thereby rejecting the null hypothesis that variables were normally distributed.

6.3 Contribution to literature

Two elements of this study were compared to existing ‘continuity of care’ literature: the measurement scales, and research design. What are the differences between this study and other studies and which aspects of this study could contribute to the literature?

1. Measurement scales

Firstly, this study contributes to contemporary literature by investigating new measurement scales for experienced continuity of care. The Nijmegen Continuity Questionnaire (NCQ) (Uijen, 2012) was used to measure experienced relational and management continuity from the patient’s perspective. Uijen et al. (2011) did not find a differentiation between informational and management continuity, which was in line with findings from Haggerty et al. (2008) but contrary to conceptual literature. Furthermore, Reid et al. (2002) mentioned that information transfer is very important but that measures for this type of continuity are the least developed. Therefore, questions measuring informational continuity of care were added to the NCQ to try to measure this type of continuity. Factor analysis gave some indication for differences between the two existing scales and the informational continuity scale, but due to cross loadings this result was not decisive. A confirmatory factor analysis should provide more insight into the relation between these three variables. Compared to other research validating continuity measurement scales, the present study has a relatively small sample size, which could be a cause for the inconclusive factor analysis outcomes (Kowalyk, Hadjistavropoulos, & Biem, 2004; Focke, 1997).

A second contribution to available literature about measurement scales is the development of two provider’s experience scales. An extensive literature review executed by Uijen et al. (2012a) found four existing scales measuring continuity of care from the provider’s perspective: CCPS-I (Continuity of Care Practices Survey, individual level), CCPS-P (parallel program level), CRP-PIM (Communication with Referring Physicians Practice Improvement Module), and CSI (Cancer Services Integration). All four scales were unsuitable for this study for two reasons: they focused on specific patient groups (e.g. cancer, addiction) and/or on coordination between and integration of multiple care providers in the treatment of one patient (Dobrow et al., 2009; Hess, Lynn, Holmboe, & Lipner, 2009; Schafer, Cronkite, & Ingudomnukul, 2004). Both developed scales in this study proved to be reliable but, as mentioned before, a larger sample size would be useful in validating both scales.
Continuity of care at an outpatient department.

2. Research design
Several aspects of the research design distinguish this study from contemporary literature: the research location and sample, the use of three scenarios, and the measurement of both patients’ and providers’ experience.

The research took place at two surgery outpatient departments from the Elisabeth and Tweesteden hospital. The sample consisted of 116 patients and 18 surgeons from these ODs. The majority of research about continuity of care is focused on General Practitioners (GPs) or the transfer between a hospital and a GP (Freeman & Richards, 1994; Baker, 1996; Saultz & Albedaiwi, 2004). A search for research in a hospital care context (search terms: continuity of care & outpatient department/secondary care/hospital/polyclinic) resulted in four studies that were comparable to this study (Uijen et al., 2012b; Wasson et al., 1984; Gill & Mainous, 1998; Homer et al., 2001). However, only Uijen et al. (2012b) measured the experienced continuity in a way similar to this study, whereas others focused on outcome measures or a continuity index.

As stated by Uijen (2012, pg. 207) ‘it is suggested to further research the experienced continuity of care of patients with different (multi) morbidity (i.e. the presence of any form (or multiple forms) of disease (Merrian-Webster, 2014)) patterns and to compare these patient groups’. Current research responds to this suggestion in researching the experienced continuity of care for one patient group: patients at an outpatient department surgery. Sub-specialty and severity of the medical complaint, together with medical information from the outpatient department assistants, give information about the (multi) morbidity of patients. This sample could be used to compare with other patient groups in future research.

The differences between continuity and lack of continuity have been studied (Saultz & Albedaiwi, 2004; Wasson et al., 1984), but no study investigated differences between more than two types of continuity before, as was done in this study. Furthermore, Van Walraven et al. (2010, pg. 954) indicated that more research was required to determine the relation between information and management continuity and patient outcomes. In this study only patient satisfaction was measured as a patient outcome, but the design could be extended and be used to investigate the relationship between the three types of continuity and other patient outcomes (e.g. health outcomes). As Van Walraven et al. (2010, pg. 954) also stated, it is important to measure the three types of continuity concurrently in order to determine interdependent influences on outcomes, which was done in current study.

Finally, experienced continuity of care from the patient’s as well as the provider’s perspective are measured in this study. One study comparing the perceptions of patients and physicians was found (Temmink, Hutten, Francke, Abu-Saad, & Van Der Zee, 2000), but the direct relationship between the patient’s perception and his or her doctor’s perception was not investigated. This study does investigate this direct relationship by measuring experienced continuity of care from all patients and their doctor. Differences in experience could indicate possibilities to improve quality of the outpatient departments because continuity of care is related to several quality outcomes. It was found that $IC_{specialist}$ did correlate positively with $RC_{patient}$ and $IC_{patient}$, but no relations for $MC_{specialist}$ were found.
6.4 Recommendations
In this section four general and two practical recommendations to improve processes at the outpatient department (OD) will be given. The four general recommendations are based on the stream chart and are more high-level and therefore more difficult to implement. The two practical recommendations can be used to increase continuity of care or quality of the outpatient department. These can be seen as more short-term solutions for the problem of relational and informational discontinuity.

6.4.1 General recommendations
There can be concluded that working at the three locations is the main core problem in the stream chart. This bottleneck is causing or increasing multiple other problems, for example: communication problems, different EMRs, travel time, and miscommunication towards patients. Several problems would be resolved when the three outpatient departments are merged into one main building in Tilburg. However, this cannot be arranged in the near future, as explained in section 3.1.8.

A second major bottleneck is the current planning system. Both surgeons and OD-assistants have several complaints about the planning; it is chaotic, variable, very tight, and not known until a few weeks before the new planning horizon. A good starting point to resolve multiple bottlenecks would be to improve the planning system. Increasing relational continuity should be possible when an optimal planning system is in place. However, ensuring a regular doctor for every patient increases the number of preconditions for the planning system, which increases the complexity.

A third bottleneck, which is related to working at multiple locations, is the use of different electronic medical records. This ensures are more difficult communication and information transfer between specialists working in two hospitals.

The final high-level bottleneck is the relationship between the OD-assistants and surgeons. Both work at the outpatient department but they are not working as one team. Structure between both groups is missing and expectations, tasks, and responsibilities are not clearly formulated. This knowledge would be very useful to be able to cooperate optimally.

6.4.2 Allocation process
As stated in section 6.1.2, there are some indications that an allocation process of patients is already used. The majority of chronic/complex participants was found in scenario 2 and 3, and the non-severe participants in scenario 1. This allocation process could be optimized to increase both patient satisfaction and employee satisfaction.

In most healthcare settings relational continuity is not as modifiable as management or informational continuity. Most healthcare providers will schedule patients with specialists they have seen before, but this is not always possible (e.g. due to planning restrictions). Furthermore, scheduling patients with one doctor does not necessarily increase quality of the OD. It could limit patients in which doctors they can see and when they can get an appointment.
Continuity of care at an outpatient department.

(i.e. waiting time) but also puts pressure on the doctors because an increased demand will increase their workload (Van Walraven, 2010).

Patients will differ in the extent to which they value relational continuity more than other aspects of care and therefore they should not be compelled to see one doctor. Patients should get the choice if they prefer to be treated by one doctor, and thereby accepting possible longer waiting times, or if they do not have a preference and thereby are scheduled when there is availability in the planning (Freeman & Hughes, 2010).

When patients prefer to be seen by one doctor, but this is logistically not possible, the number of different doctors should be minimized. An overview of doctors per sub-specialty (e.g. on the appointment card) can be used to create more trust and give patients the feeling that the best doctor available is treating them. When patients know that two (or more) doctors from the same sub-specialty with the same expertise and knowledge are treating them, they experience more consistency (i.e. continuity) of outpatient department employees (Waibel et al., 2012).

However, not only patients value continuity of care, specialists also indicated that they prefer to treat their own patients. Treating one’s own patients increases the knowledge about that patient and the control over the treatment plan. Always treating only one’s own patients is not possible due to planning restrictions and patients’ wishes. In the process of planning patients the preferences of specialists should also be taken into account. Specialists should indicate which patient groups they prefer to treat by one self (e.g. complex or sensitive complaints), and outpatient department assistants should comply with these preferences. When specialists explain this to patients as well, patients probably agree with the specialist and continue treatment from him or her.

6.4.3 Information and Communication
Bottleneck 23 (see Figure 3.2) indicates that information in the EMR was not always up-to-date or explicit. Updating patient records is an administrative burden and requires time that is not always available. This lack of information in patient records decreases informational continuity and efficiency of consultation hours (Waibel, Henao, Aller, MVargas, & Vázquez, 2012). Two recommendations about the use of patient records will be given.

Firstly, besides information about the medical condition of patients, information about patient’s preferences, values, and living situation is important to document. This information can be used to be responsive to patients’ needs and to increase the link between appointments (Haggerty et al., 2003). Regular doctors often have this knowledge about their patients, but this knowledge is compromised when multiple doctors treat one patient. The transference of personal information about patients can reduce one negative aspect of (relational) discontinuity of care.

However, reading all information from patient records and looking up the medical complaint of a patient require often quite some time. Mainly patients who have visited the OD multiple times for multiple complaints have an extensive medical record. There is barely time for preparation during the consultation hours, so this process should be facilitated. Computer-generated summaries or standardized formats for information could be a solution for this
burden. Both can facilitate a more timely transfer of knowledge and information between specialists, and between OD and other healthcare organizations (Kripalani et al., 2007). When computer-generated summaries are not available this could maybe become a task of outpatient department assistants or other personnel. In that case, the specialists should provide guidelines or a format for such a summary.

6.5 Implications for Further Research
The previous section described limitations, which can be the initiator to suggestions for further research. The first suggestion is to conduct this study with a larger sample to be able to detect smaller effects (especially in the subgroups) and generalize the results to other populations.

Furthermore, a more representative sample should be found: a sample that matches the division in scenarios and subgroups. First, the division between young and old patients should be based on existing definitions of ‘young’ and ‘old’ and not on the median of the sample. Secondly, the division of patients across the three scenarios, mainly scenario 2, should be based on clear rules and result in a distinctive division. An evident definition of ‘regular doctor’ should be established and strict rules about seeing other doctors should be set. Conducting an experiment in which patients are randomly assigned to the scenarios would be the best solution to completely distinguish patients across all three scenarios, but this would be undesirable because it influences the care of patients and disrupts the work at the outpatient department.

The used measurement scales should be reconsidered when conducting this research a second time. Patient satisfaction was measured using a validated questionnaire but as explained in section 6.2.2, patients tend to be very satisfied and thereby decreasing the ability to detect small differences between scenarios. A suggestion given by Temmink et al. (2000) is to not measure patient satisfaction but experienced quality based on pre-test and post-test measurements. Needs and expectations should be measured pre-test and patient experience (e.g. satisfaction) should be measured post-test. Quality would be excellent when experienced satisfaction was congruent with the patients’ needs and expectations.

Other measurement scales for aspects of quality should be developed. Both scales for ‘satisfaction with performance’ and ‘extra time spent’ proved to be unreliable and therefore extra effort is needed to develop a scale that could be validated and used. More research should be put into other measurable quality factors at the outpatient department to improve the measurement of quality of consults. The framework from Table 2.1 can guide this process and indicates factors for quality of an OD. However, these factors do not measure quality of consultation hours, hence more research is needed to assess measurable quality factors of consultation hours.

6.6 Conclusion
No significant differences in quality, i.e. patient satisfaction, were found between the three continuity scenarios. However, two practical recommendations about the organisation of processes at the outpatient department can be given based on the data, observations, and literature. Both recommendations might increase
continuity of care and thereby quality of the outpatient department. Firstly, optimize the allocation process of patients to one or multiple doctors to increase patient and specialist satisfaction. And secondly, increase informational continuity by using protocols for the administration in EMRs and summaries to increase the knowledge transfer between doctors.

Although the study did not yield many significant results, the research design ensured a theoretical contribution. The research design with three scenarios of continuity and the focus on surgical patients met current needs indicated by other researchers (Uijen, 2012; van Walraven et al., 2010). Another strength of the research design is the combination of qualitative and quantitative research, in which the problem statement was based on findings from a comprehensive initial problem analysis that was based on Porras’ stream method.

The quality dimensions and factors found in the literature review can be used to gain more insight into the quality of an outpatient department, which was of interest for the hospital and was an unexplored topic. The research uncovered multiple bottlenecks OD employees encounter, which decrease the quality of the outpatient department. The stream diagnostic chart (Figure 3.2) and quality framework (Table 2.1) can be used to further assess and improve the quality of the outpatient departments.
Continuity of care at an outpatient department.

References


Continuity of care at an outpatient department.


Continuity of care at an outpatient department.


Continuity of care at an outpatient department.


Continuity of care at an outpatient department.


## Appendix

### 1. Quality Indicators per Factor

#### 1. Shared values

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication policy</td>
<td>The organization ensures that the institution’s policies with therein the</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>policy choices are clearly and unambiguously communicated with all</td>
<td></td>
</tr>
<tr>
<td></td>
<td>those directly involved</td>
<td></td>
</tr>
<tr>
<td>Safety promotion</td>
<td>Employees are aware of the risky nature of their actions and provide an</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>active contribution to the safety of the workplace.</td>
<td></td>
</tr>
</tbody>
</table>

#### 2. Empowerment

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge employees</td>
<td>The policy of the organization is aimed at improving the working</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>environment where employees are challenged.*</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>(Quinn &amp; Spreitzer, 1997)</em></td>
<td></td>
</tr>
</tbody>
</table>

#### 3. Communication

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrangement meetings</td>
<td>Within the working units meetings in which all relevant topics related to</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>the work can be openly discussed are pre-arranged.</td>
<td></td>
</tr>
<tr>
<td>Coordination</td>
<td>Roles, responsibilities and the working arrangements between the</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>physician assistants and supervising doctors / specialists are</td>
<td></td>
</tr>
<tr>
<td></td>
<td>documented and communicated to all involved caregivers.</td>
<td></td>
</tr>
</tbody>
</table>

#### 7. Improvement

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance measurement</td>
<td>The registration of performance measures is recognizable for employees</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>and stimulates the improvement of processes by measurement and registration.</td>
<td></td>
</tr>
<tr>
<td>Communication innovation</td>
<td>Prior to the introduction of changes of a care process, the involved</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>caregivers are properly informed and trained if necessary.</td>
<td></td>
</tr>
<tr>
<td>Involvement innovation</td>
<td>All professional disciplines that significantly contribute to care</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>processes in daily practice are interactively involved in the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>improvement or renewal of them.</td>
<td></td>
</tr>
<tr>
<td>Absenteeism</td>
<td>Results of the past three years with regard to absenteeism per relevant</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>category of employees.</td>
<td></td>
</tr>
<tr>
<td>Turnover</td>
<td>Results of the past three years with regard to staff turnover per</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>relevant category of employees.</td>
<td></td>
</tr>
<tr>
<td>Complaints employees</td>
<td>Results of the past three years with regard to complaints and claims of</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>employees.</td>
<td></td>
</tr>
<tr>
<td>Incidents employees</td>
<td>Results of the past three years with regard to incidents and respect of</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>employees.</td>
<td></td>
</tr>
<tr>
<td>Complaints patients</td>
<td>Number of complaints and claims of patients and visitors of the past</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>three years.</td>
<td></td>
</tr>
<tr>
<td>Incidents patients</td>
<td>Number of reports of incidents related to patients and visitors of the</td>
<td>NIAZ</td>
</tr>
<tr>
<td></td>
<td>past three years.</td>
<td></td>
</tr>
</tbody>
</table>
### 8. Boundary spanning

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication referrers</td>
<td>Agreements are made about the process of timely, accurately, and completely informing referrers and sequel caregivers about the relevant developments around an individual patient.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>

### 9. Strategic protection

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role manager</td>
<td>The policy of the organization is aimed at the fact that managers and supervisors set an example when it comes to a permanent focus on quality and safety.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Safety aspects</td>
<td>The team leaders of working units provide periodic check ups, including conversations with employees, which gain insight in the safety aspects and risks in their work unit.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>

### 10. Administration

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage post-surgical control</td>
<td>Total number of post-surgical control appointments within 24 months divided by the total number of bariatric surgeries in that year</td>
<td>IGZ</td>
</tr>
</tbody>
</table>

### 11. Treatment process

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-stop-shop</td>
<td>Is there the possibility to receive tests, results and treatment on the same day?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Tests one day</td>
<td>Is there the possibility to plan the consult with the treatment plan, tests, and pre-surgical screening on one day?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Diagnostic tests</td>
<td>Is there the possibility to undergo all tests on one day?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Mamma tests 1 day</td>
<td>Which diagnostic tests take place on the day of the first consult: palpate breasts, fine needle aspiration, histological biopsy, and stereotactic biopsy? (mamma care)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Mamma tests 5 days</td>
<td>Which diagnostic tests take place within five days after the first consult: histological biopsy, stereotactic biopsy? (mamma care)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Preference surgeon</td>
<td>May the patient choose which surgeon will perform the surgery? (when multiple caregivers are involved)?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Preference specialist</td>
<td>At the time of making the appointment, is the patient asked whether he has a preference for a specialist?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Control appointment</td>
<td>Who is seeing the patient at the control appointment after surgery? For example, operating specialist, physician assistant, physician, etc.*</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Choice control appointment</td>
<td>How is the follow-up organised? (Control appointment, phone call, preference patient, no follow-up)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Clinical pathway</td>
<td>Are there clinical pathways in place?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Time 1st consult</td>
<td>What time is scheduled for the first consult?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Time diagnosis consult</td>
<td>What time is scheduled for the consult where the diagnosis is explained?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Time follow-up consult</td>
<td>What time is scheduled for a follow-up consult?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Extra time consult</td>
<td>How is dealt with patients that need or prefer more time per consult? (extra time scheduled, extra time scheduled when needed after 1st consult, short-term extra consult, not possible)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Involved caregivers</td>
<td>Which caregivers are involved in the treatment process?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Preference diagnosis</td>
<td>Do patients always get the question if they prefer an extra caregiver during the consult where the diagnosis is communicated?* (lung carcinoma)</td>
<td>ZiZo</td>
</tr>
</tbody>
</table>
### Continuity of care at an outpatient department.

<table>
<thead>
<tr>
<th>Independent consultation hours</th>
<th>Which caregivers have an independent consultation hour?*** (lung carcinoma)</th>
<th>ZiZo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development plan</td>
<td>When and how is the treatment plan developed?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Involvement plan</td>
<td>Who are involved in the development of the treatment plan?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>MDT</td>
<td>Are mamma patients treated by a multidisciplinary team?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Clinical pathways</td>
<td>Are people from the patient perspective involved with the development of clinical pathways?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Information transfer</td>
<td>How is the information transfer between different caregivers? Are there guidelines for this transfer?</td>
<td>ZiZo</td>
</tr>
</tbody>
</table>

**Agreements coordination**

If necessary, in addition to standardization agreements are made for other forms of coordination (multidisciplinary consults, instruction, supervision, etc.) in order to maintain responsible processes.

**Coordination of tasks**

About the division of tasks, responsibilities and powers between the various professional disciplines that are involved in the same (care) processes agreements exist, which are communicated directly with those involved.

**Communication caregivers**

Agreements are made about the transfer of information between caregivers who are involved in one single care process.

* Pulmonary nurse, oncology nurse, nurse specialist, physician assistant.

** Pulmonary nurse, oncology nurse, nurse specialist, physician assistant, nurse assistant, research nurse.

### 12. Communication (patient)

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consult change</td>
<td>Is the patient informed beforehand in case another specialist is seeing him at the follow-up appointment? (telephonic, e-mail, letter, at moment of registration at polyclinic, new appointment, no information)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Contact person</td>
<td>Is there a contact person per part of the treatment? (diagnosis, treatment, after-care, palliative care)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Contact person note</td>
<td>Does the patient receive the name of the contact person on paper?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Test results</td>
<td>Which test results do the patients receive on the same day?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Information choices</td>
<td>The patient is informed why the choice for a dermatologist or a vascular surgeon is made? (orally informed, explanation on paper, information via website, no information)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Safety awareness</td>
<td>Patients and their carers are informed about the possibility and stimulated to report unsafe situations and to be alert about safety aspects in the healthcare.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Responsible caregiver</td>
<td>The hospital ensures that the patient is informed about which specialist will be responsible for the individual care process and which caregiver will be the first contact point.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Communication about changes</td>
<td>In case a caregiver other than the primary treating physician takes over (a part of) the treatment, the patient is clearly and timely informed and it will be mentioned in the patient file.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Communication involved caregivers</td>
<td>In case students, interns and / or co-assistants are involved in the (care) processes, the patient will be clearly and timely informed and asked for his permission.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>
13. Information provision

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability information</td>
<td>About which topics are the patients informed? (orally, on paper, on website) For example: possible treatments, surgery techniques, painkillers, possible complications, precepts, etc.</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Availability online</td>
<td>Is orally provided information also available on the website?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Availability footage</td>
<td>Do pictures or movies support information to the patient?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Receive material</td>
<td>Do patients receive the material to take it home with them?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Provision leaflets</td>
<td>Which leaflets do patients receive? (leaflet hospital, leaflet patient association, leaflet funds or associations)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Leaflets online</td>
<td>Are the provided leaflets also available on the website?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Accessibility outside office hours</td>
<td>Do patients receive a telephone number or email address that they can use in the evening, at night, or in weekends when they have questions?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Response time</td>
<td>What is the response time for these calls or emails?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Questions</td>
<td>How is the polyclinic accessible for questions after surgery? (telephonic, by e-mail to nurse/specialist, walk-in consultation hours, e-consult, patient is called for check-up)</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Treatment plan Informed consent</td>
<td>Do patients receive their treatment plan on paper? Information to the patient about the proposed research, state of health and the proposed treatment is done in a way that the patient can provide informed consent or refuse treatment.</td>
<td>ZiZo</td>
</tr>
</tbody>
</table>

14. Protocols

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening heritable gene</td>
<td>Will it be examined by default whether there is an indication for investigation of a hereditary gene that causes gastric carcinoma?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Screening family</td>
<td>Do family members of patients with a possible genetic predisposition get the offer for a screening to check for the presence of gastric carcinoma by default?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Screening Hp</td>
<td>Are the patients screened for Helicobacter pylori by default?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Screening family Hp</td>
<td>Are family members screened as well when Helicobacter pylori is diagnosed with the patient?</td>
<td>ZiZo</td>
</tr>
<tr>
<td>Organization</td>
<td>The board ensures that the working units know the applicable regulations, protocols, (work) instructions, standards, guidelines and standards and, if necessary, adapt the processes to these.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Process design</td>
<td>The institution has standardized and documented the (care) processes in procedures, protocols and work instructions, in which priority is given to the risky processes.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>CPR protocol</td>
<td>The work unit and employees are familiar with the agreements about CPR and regularly practice their role in this process.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Emergency protocol</td>
<td>The work units are familiar with the internal emergency plan and regularly practice their role in this process, in particular the evacuation of buildings.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>

15. Waiting times

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waiting times</td>
<td>How long do you need to wait for a consult or treatment?</td>
<td>NVZ</td>
</tr>
<tr>
<td>Waiting times history</td>
<td>Waiting times and throughput times per relevant category of patients and visitors of the past three years.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>
### 16. Outcomes/satisfaction

<table>
<thead>
<tr>
<th>Title</th>
<th>Indicator</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient experience</td>
<td>How do patients experience the care at the polyclinic?</td>
<td>NVZ</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>How satisfied are the employees with the polyclinic?</td>
<td>NVZ</td>
</tr>
<tr>
<td>Employee satisfaction</td>
<td>Results of the past three years with regard to the satisfaction of employees.</td>
<td>NIAZ</td>
</tr>
<tr>
<td>Patient satisfaction</td>
<td>Results of the past three years with regard to patient satisfaction.</td>
<td>NIAZ</td>
</tr>
</tbody>
</table>
2. Relations between bottlenecks

[Diagram showing relations between bottlenecks with various data points marked with Xs and arrows indicating cause and result.]
3. Problem stories

3.1 Waiting times

The main cause for increased waiting times is delay in the consultations: being behind schedule (4). A bad scheduling of patients in available time slots (14) could result in delay: patients need more time than is scheduled for their appointment (e.g. bad news conversations take more time than a control appointment with no complications). Sometimes it is impossible to estimate the duration of a consult but a good screening at the phone and the assistants’ insight into patients and their diagnoses (7) could result in a better planning with enough time per patient.

The legal administrative burden (9) for doctors is very high and requires several minutes per patient: that time is not always available in the schedule. Furthermore, because doctors work at multiple locations (11) they need to switch between EMR systems because both hospitals work with a different system. This requires more time for preparation and administration (8) because they cannot prepare from another location. Systems could also be down (19), which increases the administrative burden even more: doctors should write everything down and update the system at a later time.

Because doctors work at multiple locations (11) and see patients from each other (16) the preparation of consults with patients requires more time (13). Collaboration and communication between doctors about shared patients is more time-consuming (3) because of the absence of structured communication (1). There is no structured transfer of knowledge about patients, and EMRs could be incomplete (23); this could result in the need for discussions between colleagues. The preparation and communication about these shared patients requires more time, which is not calculated into the planning of the consults and hence results in delays.

Another cause for waiting times, and access times for an appointment at the outpatient department as well, is increased demand from patients (29). The capacity of the OD is currently insufficient in meeting the demand. Because patients are moving between the three locations (11) the patient numbers are redistributed and this could result in an increased demand for some sub-specialities at one outpatient department. Moreover, the number of trauma patients is increasing and this also adds up to the increased demand.

Finally, scheduling problems (30) result in bottlenecks in the planning which causes waiting times. These problems are both caused by the doctors (e.g. incorrect scheduling of patients or vacations) and by the patient centeredness of the outpatient department: current patients with a question or problem usually receive an appointment the same day, even when there is no capacity available in the planning. These actions require flexibility in the planning, which is lacking due to the tight schedule (18).
3.2 Mistakes
Mistakes can easily be made when there is no structured communication between caregivers (1). Because multiple doctors see a particular patient (16) it is important that there is a good knowledge transfer. Information about patients can be missed when the EMR is not up to date (23) and doctors do not communicate with each other. They work at three locations (11) and therefore need to switch between systems, assistants, patients and resources. It requires more time for preparation (13) and reading patients’ files. Working at multiple locations causes the communication to become more difficult and time consuming (3): more information needs to be transferred. Also patients could make mistakes because they need to travel between hospitals and switch between doctors: it is possible that they do not remember where and with whom they had an appointment.

Increased delays in the planning (4) could also result in more mistakes because doctors and assistants become stressed and hurried. When they feel pressure to work more efficiently and decrease the waiting times this could cause mistakes.

An EMR system that is not up to date (23) or that is down (19) could result in mistakes as well. The doctor should rely on the patient and can only base decisions on the information the patients give. Patients could easily forget important factors (e.g. allergies, medical history), but also important test results or decisions colleagues have made could be missing. Doctors completely rely on the system because there is no structured communication about patients (1), so when systems are not working or not updated it becomes difficult to correctly treat patients.

Because of a tight schedule (18) there is not much room for preparation and administrative tasks. This preparation is particularly important in case doctors see patients from their colleagues (16). When doctors do not know everything there is to know about a patient when entering the treatment room there is the possibility that information is missed or forgotten.

Changes in the treatment plan (17) of a patient could be very confusing for the patient. Often the changes itself are not causing mistakes or problems but patients could easily forget instructions or information when their treatment changes frequently. For example, a patient could forget to clean a wound in a specific way because the previous doctor did not say this was necessary.

A last factor that could result in mistakes is the fact that patients need to call for their control appointment (6) because planning is not available until a few weeks before (22). Patients could forget to plan this control appointment (25) because they no longer have medical complaints. However, the patient should plan a control appointment for a reason and it could result in health problems when the appointment is forgotten.
4. Three Research Topics

4.1 Option 1: Multiple doctors

How could the care process be organized in order to improve the quality?

For example:

- How could the intercommunication/information transfer be optimized?
- How could the communication be supported? (EPR/system/protocol?)
- How could the role/function of assistants be adapted in order to improve?
- Develop restrictions for the planning of patients (which patients should definitely stay with one doctor?).
- Guide the process of changing treatment plans (guidelines).
- The willingness of surgeons to follow original treatment plan/guidelines.

Multiple doctors results in:

- Lower employee satisfaction.
- Difficult communication about one patient.
- More time needed for preparation/consult
  - Delays (lower efficiency)
- Changes in treatment (intentionally/accidentally)
- Mistakes due to lack of knowledge about patient.
- Discontinuity of care

Underlying problems/causes:

1. No structured communication → mistakes/more time needed for prep.
2. Bad administration in EPR → mistakes/more time needed for prep.
3. Different treatment method per surgeon (no single standard).
4. Not following original treatment plans (own opinion/view).
5. Tight schedule, no time for preparation → delays.
6. (Planning, variable/late)
7. (3 locations)

Theories/models:

1. Complex adaptive system, surgeons with different mental models.

A complex adaptive system is a collection of individual agents with freedom to act in ways that are not always totally predictable, and whose actions are interconnected so that one agent’s actions changes the context for other agents. Examples include the immune system, a colony of termites, the financial market, and just about any collection of humans (for example, a family, a committee, or a primary healthcare team).

*The challenge of complexity in healthcare*

[http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1121189/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1121189/)

Surgery and other disciplines have moved to a systems-based approach that involves healthcare delivery by teams of providers rather than by independent clinicians. *Professionalism and the Shift Mentality (van Eaton et al.)*


(Informational, management & relational continuity.)
Interpersonal continuity: the aspect of continuity of care related to the ongoing relationship between an individual doctor and patient (association with hospitalization and increased preventive care).

*Interpersonal Continuity of Care and Care Outcomes: A Critical Review (Saultz et al.)*

3. ITCP: information transfer and communication practices.
The Information Transfer and Communication Practices (ITCP) Project is a multi-institutional effort to: 1) better understand surgeon ITCP and their patient care consequences, 2) determine what has been done to improve ITCP in other professions, and 3) recommend ways to improve these practices among surgeons. *Surgeon Information Transfer and Communication, Factors Affecting Quality and Efficiency of Inpatient Care (Williams et al.)*

4.2 Option 2: Relationship doctor assistant.
The partnership is not part of the hospital; they are an independent ‘company’. The polyclinic is part of the hospital and the assistants are employed by the hospital. These two groups are separate teams but form one team in the process of treating a patient at the polyclinic. The assistants are facilitating the consultation hours of the doctors, plan appointments with the patients and perform small medical procedures.

Topics of interest:
1. Flexible versus one team.
All assistants are facilitating every doctor during consultation hours (TSZ): optimal flexible, when someone is ill or absent this is no problem. But this increases discontinuity due to personal relationships and indistinctness about tasks. There is no personal relationship between doctors and assistants. The discontinuity could be reduced by working in more stable teams.

→ teamwork: personal relationship, clarity about tasks and methods, know what is expected. *Team diversity* (function, education, power) & fault lines (sub teams): two groups are working together as one team.

2. Demands/resources.
Every doctor has a different method for the treatment of patients and therefore the assistants need to be adaptive. The demands, resources and requirements for their job change all the time. How do they cope with this and know what to do when? → Guidelines per doctor about treatment method & more standardized way of working for doctors (shared mental models).

3. Role expectation and conception. *(Combination with 2)*
The polyclinic team is functioning as if they are employed by the partnership: the partnership is their boss. However, the partnership is not employed by the hospital and therefore disjunctive from the polyclinic. It is unclear for the polyclinic what demands/tasks/responsibilities the partnership really has and what is imposed on the partnership by the hospital. The partnership is not employed so there are several things they cannot decide or influence.
For both sides: how do the assistants see the partnership, and the other
way around. What do they expect of each other. What are tasks/responsibilities
of which group? How do they work together?
Furthermore, what do doctors expect from the assistants? How do they
need to perform their jobs? What is their tasks package? Need to be consensus
between doctors: shared mental models.

4. Priorities.
What has priority in both groups (polyclinic/partnership)? Priority in planning,
for example: education (co-assistants), meetings, OR? How is the utilization of
the polyclinics (consultation hours): rooms, and staff? Could this be optimized?
Could there be a more efficient use of the resources? Planning polyclinic in
relation to the planning of the surgeons.
For example: There is no room available for an extra consultation hour, while a
surgeon came available and could help 30 patients in order to minimize the
access times → flexibility in planning and with resources.

4.3 Option 3: Organization consultation hours
Several bottlenecks are influencing the efficiency and patient-centeredness of the
consultation hours:
- Disturbances during a consult.
- Administrative burden that requires time.
- No room for other tasks in tight schedule (questions/prep/admi).
- Delays and thereby less time for some patients.

How could the organisation of the consultation hours be optimized in order to
work more efficiently and patient-centered?

For example:
- What tasks could be handled by assistants or specialist nurses? (e.g.
aftercare, introduction of consult) → mamma care nurses
  ○ Combined appointment with nurse, already done in
    stoma/wound/mamma care. Specialist visits the consult when he
    has time.
- How could the administrative burden during a consult be minimized? (8
  minutes consult, 2 minutes administration)
- How could the preparation of consultation hours be facilitated? (by
doctor or maybe a assistant)
- How could the disturbances during a consult be minimized?
- How could the problem of ‘multiple doctors’ be minimalized with the
  organisation of the consults? (for example, always the same assistants?)
5. QUESTIONNAIRE FOR PATIENTS

Beste heer/mevrouw,

Voor mijn afstudeerproject aan de Technische Universiteit Eindhoven doe ik in samenwerking met de maatschap en zorgeenheid Chirurgie onderzoek naar de optimale organisatie van een polikliniek. Dit onderzoek voer ik uit op de poliklinieken Heelkunde van het Elisabeth ziekenhuis en het TweeSteden ziekenhuis.

De kwaliteit van een polikliniek wordt bepaald door een groot aantal factoren, waarbij de patiënttevredenheid een erg belangrijke is. Met deze vragenlijst wil ik inzicht krijgen in uw ervaring met afspraken die u op deze poli heeft gehad en uw tevredenheid met de polikliniek in het algemeen. Het doel van dit onderzoek is om de kwaliteit van de polikliniek te vergroten en daarmee onder andere wachttijden te verkorten.

Deze vragenlijst gaat over uw ervaring met de zorgverleners van de polikliniek heelkunde waar u de afgelopen tijd afspraken mee heeft gehad voor de behandeling van uw huidige medische klacht.

Alle informatie op de volgende pagina’s zal vertrouwelijk worden behandeld en uw antwoorden zullen niet worden gecommuniceerd naar uw zorgverleners of derden.

Het invullen van de vragenlijst zal ongeveer 5 minuten van uw tijd in beslag nemen.

Hartelijk bedankt voor uw medewerking!
Renske van Dongen
De volgende vragen gaan over de afspraak die u net heeft gehad:

1. Ik ken deze specialist heel goed.
2. Deze specialist kent mijn medische voorgeschiedenis heel goed.
3. Deze specialist weet altijd wat hij/zij in eerdere contacten heeft gedaan.
4. Deze specialist kent mijn familieomstandigheden heel goed.
5. Deze specialist kent mijn dagelijkse bezigheden heel goed.
6. Deze specialist neemt zelf contact met mij op als dat nodig is, zonder dat ik er om vraag.
7. Deze specialist weet heel goed wat ik belangrijk vind in mijn zorg.
8. Deze specialist houdt voldoende contact met mij als ik gezien word door andere hulpverleners.

De volgende vragen gaan over de afspraak die u net heeft gehad:

1. Deze specialist was op de hoogte van mijn klachten.
2. Deze specialist was op de hoogte van de inhoud van mijn vorige consulten.
3. Problemen uit vorige consulten zijn opnieuw aan de orde gekomen tijdens dit consult.
De volgende vragen gaan over de samenwerking tussen de verschillende zorgverleners die u heeft gezien op deze polikliniek:

<table>
<thead>
<tr>
<th></th>
<th>Zeer eens</th>
<th>Oneens</th>
<th>Neutraal</th>
<th>Eens</th>
<th>Zeer eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Deze zorgverleners dragen informatie heel goed aan elkaar over.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Deze zorgverleners werken heel goed samen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. De zorg van deze zorgverleners sluit heel goed op elkaar aan.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Deze zorgverleners weten van elkaar altijd wat ze doen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hieronder staat een lijst met stellingen over medische zorg. Lees deze stellingen met in uw achterhoofd uw ervaring van de medische zorg die u heeft ontvangen op deze polikliniek.

Kunt u aangeven hoe zeer eens of oneens u het bent met de volgende stellingen:

<table>
<thead>
<tr>
<th></th>
<th>Zeer eens</th>
<th>Oneens</th>
<th>Neutraal</th>
<th>Eens</th>
<th>Zeer eens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dokters leggen de reden van medische testen goed uit.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Ik vind dat de polikliniek alles in huis heeft om complete medische zorg te leveren.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. De zorg die ik heb ontvangen is bijna perfect.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Soms twijfel ik er aan of de diagnose van een dokter wel juist is.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. De zorgverleners zijn erg zorgvuldig met het controleren van alles als ze me onderzoeken en behandelen.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Ik heb makkelijk toegang tot de medische specialist die ik nodig heb.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Dokters zijn te zakelijk en onpersoonlijk tegen mij.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Z.O.Z.
8. Mijn dokter behandelt me op een vriendelijke en beleefde manier.

9. De zorgverleners die mij behandelen zijn soms te gehaast tijdens een consult.

10. Dokters negeren soms wat ik ze vertel.

11. Ik heb twijfels over de kundigheid van de dokters die me behandelen.

12. Dokters besteden doorgaans genoeg tijd aan mij.

13. Ik vind het lastig om direct een afspraak op de poli te krijgen.

14. Ik ben ontevreden over sommige aspecten van de zorg die ik ontvang.

15. Ik ben in staat om medische zorg te krijgen wanneer ik dat wil.

<table>
<thead>
<tr>
<th>Zeer oneens</th>
<th>Oneens</th>
<th>Neutraal</th>
<th>Eens</th>
<th>Zeer eens</th>
</tr>
</thead>
</table>

U kunt de vragenlijst inleveren bij mij of bij de assistente achter de balie.

- Bedankt voor uw medewerking! -
6. Questionnaire for Specialists

<table>
<thead>
<tr>
<th>Zeer eens</th>
<th>Oneens</th>
<th>Neutraal</th>
<th>Eens</th>
<th>Zeer eens</th>
</tr>
</thead>
</table>

1. Alle benodigde medische informatie was beschikbaar voor het consult.

2. Deze medische informatie heb ik gebruikt bij het nemen van beslissingen tijdens het consult.

3. Persoonlijke informatie over de patiënt (bijv. persoonlijkheid, leefsituatie, normen en waarden) is opgenomen in het dossier.

4. Er is een standaard behandel-methode voor deze patiënt.

5. Ik ben niet afgeweken van het oorspronkelijke behandelplan van deze patiënt.

6. Er zijn aanpassingen gemaakt aan de oorspronkelijke behandeling die gevolgen hadden voor de patiënt.

<table>
<thead>
<tr>
<th>Zeer eens</th>
<th>Oneens</th>
<th>Neutraal</th>
<th>Eens</th>
<th>Zeer eens</th>
</tr>
</thead>
</table>

1. Ik wist te weinig van deze patiënt om hem optimaal te kunnen behandelen.

2. Ik kon niet optimaal efficiënt werken omdat deze patiënt onbekend was voor mij.

3. Ik had meer tijd (voorbereiding en consult) nodig gehad om deze patiënt optimaal te kunnen behandelen.

4. Er zijn veranderingen gemaakt aan het behandelpplan waar ik het niet mee eens ben.

5. Ik vind het moeilijk te verkopen aan deze patiënt waarom hij/zij meerdere artsen ziet.

Hoeveel ‘onnodige’ tijd heeft u besteed aan het verkrijgen van de juiste informatie over deze patiënt om hem/haar goed te behandelen? (bijv. voorbereiding/extra vragen stellen)

- 0 minuten
- 1 minuut
- 2 minuten
- 3 minuten
- > 3 minuten
7. Original measurement scales

Measurement scales for the patient:

**Relational continuity (RCpatient)**
RC1. Ik ken deze specialist heel goed.
RC2. Deze specialist kent mijn medische voorgeschiedenis heel goed.
RC3. Deze specialist weet altijd wat hij/zij in eerdere contacten heeft gedaan.
RC4. Deze specialist kent mijn familieomstandigheden heel goed.
RC5. Deze specialist kent mijn dagelijkse bezigheden heel goed.
RC6. Deze specialist neemt zelf contact met mij op als dat nodig is, zonder dat ik er om vraag.
RC7. Deze specialist weet heel goed wat ik belangrijk vind in mijn zorg.
RC8. Deze specialist houdt voldoende contact met mij als ik gezien word door andere hulpverleners.

**Management continuity (MCpatient)**
MC1. Deze zorgverleners dragen informatie heel goed aan elkaar over.
MC2. Deze zorgverleners werken heel goed samen.
MC3. De zorg van deze zorgverleners sluit heel goed op elkaar aan.
MC4. Deze zorgverleners weten van elkaar altijd wat ze doen.

**Informational continuity (ICpatient)**
IC1. Deze specialist was op de hoogte van mijn klachten.
IC2. Deze specialist was op de hoogte van de inhoud van mijn vorige consulten.
IC3. Problemen uit vorige consulten zijn opnieuw aan de orde gekomen tijdens dit consult.

**Patient satisfaction (PS)**
PS1. Dokters leggen de reden van medische testen goed uit.
PS2. Ik vind dat de polikliniek alles in huis heeft om complete medische zorg te leveren.
PS3. De zorg die ik heb ontvangen is bijna perfect.
PS4. Soms twijfel ik er aan of de diagnose van een dokter wel juist is.
PS5. Ik ben er zeker van dat ik de nodige medische zorg kan ontvangen zonder in financiële problemen te komen.*
PS6. De zorgverleners zijn erg zorgvuldig met het controleren van alles als ze me onderzoeken en behandelen.
PS7. Ik moet meer betalen voor mijn medische zorg dan ik kan betalen.*
PS8. Ik heb makkelijk toegang tot de medische specialist die ik nodig heb.
PS9. Waar ik medische zorg ontvang moeten mensen te lang wachten op een spoed behandeling.*
PS10. Dokters zijn te zakelijk en onpersoonlijk tegen mij.
PS11. Mijn dokter behandelt me op een vriendelijke en beleefde manier.
PS12. De zorgverleners die mij behandelen zijn soms te gehaast tijdens een consult.
PS14. Ik heb twijfels over de kundigheid van de dokters die me behandelen.
PS15. Dokters besteden doorgaans genoeg tijd aan mij.
PS16. Ik vind het lastig om direct een afspraak op de poli te krijgen.
PS17. Ik ben ontevreden over sommige aspecten van de zorg die ik ontvang.
PS18. Ik ben in staat om medische zorg te krijgen wanneer ik dat wil.

* item deleted
Continuity of care at an outpatient department.

**Measurement scales for the specialist:**

**Informational continuity (IC\textsubscript{specialist})**

IC1. Alle benodigde medische informatie was beschikbaar voor het consult.
IC2. Deze medische informatie heb ik gebruikt bij het nemen van beslissingen tijdens het consult.
IC3. Persoonlijke informatie over de patiënt (bijv. persoonlijkheid, leefsituatie, normen en waarden) is opgenomen in het dossier.

**Management continuity (MC\textsubscript{specialist})**

MC4. Er is een standaard behandelmethod voor deze patiënt.
MC5. Ik ben niet afgeweken van het oorspronkelijke behandelplan van deze patiënt.
MC6. Er zijn aanpassingen gemaakt aan de oorspronkelijke behandeling die gevolgen hadden voor de patiënt.

**Specialist satisfaction**

1. Ik wist weinig van deze patiënt om hem optimaal te kunnen behandelen.
2. Ik kon niet optimaal efficiënt werken omdat deze patiënt onbekend was voor mij.
3. Ik had meer tijd (voorbereiding en consult) nodig gehad om deze patiënt optimaal te kunnen behandelen.
4. Er zijn veranderingen gemaakt aan het behandelplan waar ik het niet mee eens ben.
5. Ik vind het moeilijk te verkopen aan deze patiënt waarom hij/zij meerdere artsen ziet.

**Extra time spent**

Hoeveel ‘onnodige’ tijd heeft u besteed aan het verkrijgen van de juiste informatie over deze patiënt om hem/haar goed te behandelen? (bijv. voorbereiding/extra vragen stellen)