

# EMPOWERMENT OF RESIDENTS FOR INTRAPROFESSIONAL COLLABORATION:

the Role of Context, Culture and Power Dynamics

Natasja Looman

## Propositions

1. Intraprofessional collaboration is not learned spontaneously - *This thesis*
2. Residents should both proactively share their own expertise *and* proactively ask for each other's expertise. This is a responsibility of *all* parties involved: residents, supervisors, teachers and program directors - *This thesis*
3. If non-constructive power dynamics are at play, any intraprofessional intervention and learning activity will fail its purpose. First, the (impact of the) power dynamics will have to be openly addressed, understood and discussed and made constructive - *This thesis*
4. Implicit attitudes and beliefs - about another person or profession- are contagious - *This thesis*
5. When the roles and responsibilities - of the various professionals - are divided in a clear and functional way, hierarchy can provide a strong foundation for (learning) intraprofessional collaboration - *This thesis*
6. (learning) Intraprofessional collaboration goes beyond empowering residents and learning new skills; it is about establishing a culture where "I" is replaced by "we" - *This thesis*
7. The lack of (learning) intraprofessional collaboration cannot be solved by education alone; supervisors (teams) must also continuously train themselves in intraprofessional collaboration and reflect on their own performance - *This thesis*
8. Diversity is being invited to the party; inclusion is being asked to dance – *Verna Myers*
9. If everyone is moving forward together, then success takes care of itself – *Henry Ford*

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for Intraprofessional Collaboration:  
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**Natasja Looman**

#### Colofon

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*“Fight for the things that you care about, but do it in a way that will lead others to join you”*

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**Ruth Bader Ginsburg**

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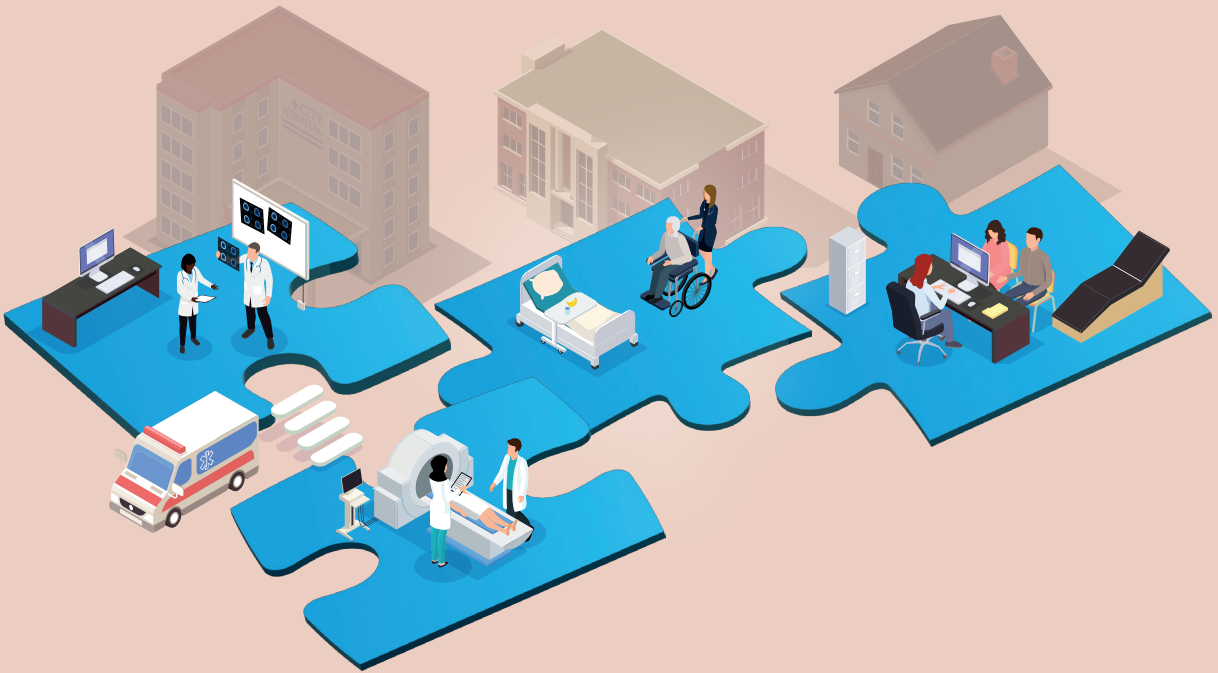
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*“I can do things  
you cannot,  
you can do  
things I cannot.  
Together we can  
do great things”*



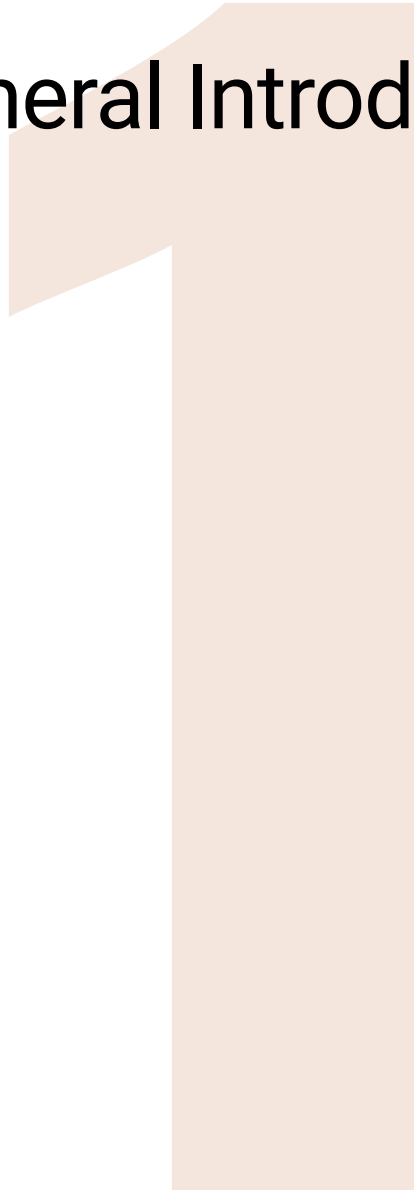
**Anjeze Gonxhe Bojaxhiu (better known as: Mother Teresa)**





# CHAPTER 1

General Introduction



## NEED FOR INTRAPROFESSIONAL COLLABORATION

The growing number of patients with multimorbidity and its associated complexity is leading to a shift in demands on the healthcare system<sup>1-3</sup> as these patients need to be seen by multiple physicians from multiple specialties. A single patient may be treated by different physicians both in the hospital setting (e.g., medical specialists) and in the primary care setting (primary care physicians, e.g., family physicians or elderly care physicians)<sup>4</sup>. This requires physicians not only to be proficient in their own professional work but also to have knowledge of the roles and expertise of other physicians and how to collaborate with them. Unfortunately, adverse events resulting from human error are frequently reported in healthcare<sup>5,6</sup>. In this regard, deficient communication and information transfer are often noted as issues<sup>7,8</sup>. A common factor contributing to these events is ineffective collaboration between physicians, particularly between primary care physicians and medical specialists<sup>7,9</sup>.

The current trend, meanwhile, is to translocate parts of healthcare service provision from the hospital to primary care if and when possible<sup>10</sup>, leading to increased transitions of patients and knowledge<sup>7,9,11,12</sup>. As both complexity and transitions in care are related to an increased risk of error, it is important to share knowledge and to provide coherent and coordinated care to prevent adverse events<sup>4,7,13-15</sup>. As proficient intraprofessional collaboration is vital to safeguard coherent care<sup>14,16-18</sup> and to maintain quality of care<sup>19-22</sup>, therefore, optimal collaboration among physicians is becoming more and more important<sup>18,21-24</sup>.

### Definitions of inter- and intraprofessional collaboration and inter- and intraprofessional learning/education based on World Health Organization 2010<sup>25</sup>

#### **Interprofessional Collaboration**

Interprofessional collaboration occurs when *individuals from two or more different professions* (e.g., surgeon and nurse; family physician and occupational therapist, etc.) work together with each other and with patients/ caregivers to deliver the highest quality of care.

#### **Interprofessional Learning/ Education**

Interprofessional learning/education occurs when *individuals from two or more different professions* (e.g., surgeon and nurse; family physician and occupational therapist, etc.) learn about, from and with each other to promote effective collaboration and improve health outcomes.

### Definitions of inter- and intraprofessional collaboration and inter- and intraprofessional learning/education based on World Health Organization 2010 <sup>25</sup>

<b>Intraprofessional Collaboration</b>	Intraprofessional collaboration occurs when <i>individuals from two or more different disciplines within a single profession</i> (e.g., different physicians such as surgeon and family physician) work together with each other and with patients/caregivers to deliver the highest quality of care.
<b>Intraprofessional Learning/ Education</b>	Intraprofessional learning/education occurs when <i>individuals from two or more different disciplines within a single profession</i> (e.g., different physicians such as surgeon and family physician) learn about, from and with each other to promote effective collaboration and improve health outcomes

### Do we really have to *learn to collaborate*?

Collaboration between physicians mostly occurs via remote contact tools such as phone calls, teleconsultations or referral/discharge letters. On the one hand, this type of contact seems to increase intraprofessional collaboration (intraPC) between physicians (primary care and medical specialists)<sup>26</sup>. On the other hand, it creates tensions and ambiguity regarding the division of roles and responsibilities, and the quality of such collaboration is not always sufficient<sup>26</sup>. It may seem self-evident that physicians collaborate intraprofessionally, but intraPC often appears to be impeded by imbalances in authority, ignorance of other people's roles and boundary frictions when delivering patient care<sup>26-32</sup>. Learning to collaborate, therefore, is a necessary step in preparing physicians for collaborative practice<sup>25</sup>.

There is growing evidence that interprofessional learning/education positively affects attitudes and perceptions of one another, increases collaborative knowledge and skills and leads to changes in behavior, organizational practice and benefits to patients<sup>33,34</sup>. The WHO, therefore, has proposed a framework for action to provide policymakers with strategies and ideas for developing interprofessional education and collaborative practice<sup>25</sup>. It has been shown that physicians often do not deliberately learn on the job and do not adequately recognize or exploit learning opportunities in their work-related activities<sup>35</sup>. Residents have something to gain here because they are involved in an explicit learning process and are expected to achieve learning goals during their postgraduate training programs<sup>36</sup>. As effective intraPC has proven to be quite challenging<sup>37</sup>, the learning of such collaboration should receive explicit attention, preferably starting in postgraduate training <sup>18,38,39</sup>.

## POSTGRADUATE WORKPLACE LEARNING

Postgraduate medical specialty training is predominantly workplace-based. Workplace-based learning (WPBL) refers to learning in the clinical setting or learning on the job<sup>40,41</sup>. This is a highly effective way of learning because of its high authenticity and the active involvement of residents in clinical work. Key characteristics of WPBL are non-formal and incidental learning and implicit, unstructured learning. The so-called “tacit curriculum” plays an important role in WPBL. Workplace learning processes are mostly unintentional, spontaneous and unplanned, happening more or less coincidentally as a result of residents’ day-to-day activities, rather than resulting from highly structured teaching programs (formal education)<sup>40,42,43</sup>. As residents are often trained in a specialty-specific “silo”, their postgraduate workplace learning occurs in isolation from other disciplines, focusing mainly on their own specialty<sup>44</sup>. The logistics needed to make residents from different specialties meet are often an insurmountable barrier<sup>36</sup>, and due to clinical requirements and curricular limitations, opportunities for residents to work and learn together and to build intraprofessional relations in this way are limited<sup>36,45</sup>. Intraprofessional learning, therefore, needs to be purposely organized and formalized.

### Intraprofessional learning and education

A qualitative study by Beaulieu et al. into the barriers to teaching collaboration between general practitioners and medical specialists in the training environment showed that intraprofessional learning has currently been formalized to a very limited extent only<sup>44</sup>. On some occasions, there are contacts between primary care and medical specialty residents, but these are barely used as learning opportunities<sup>36</sup>. It is known that the proximity of different professions in shared educational and clinical spaces, direct contact, sufficient time allocation and an individual’s interpersonal capabilities are key to building mutual rapport<sup>26,46</sup>. In the absence of these conditions, negative professional stereotypes may inadvertently be reinforced<sup>46</sup>. The distance between primary care and medical specialty as a workplace and as a teaching environment was described as a deeply-rooted obstacle to learning effective intraPC<sup>44</sup>. What is essential for learning intraPC is to learn in the proximity of residents from different specialties in the same workplace, a better understanding of each other’s roles and responsibilities and improved levels of communication<sup>36,46,47</sup>. It is precisely this proximity in the workplace setting, therefore, that we should utilize in organizing and providing intraprofessional learning activities.

### Out-of-specialty (hospital) placements

Worldwide, residents undertake placements (rotations) in specialties other than the one they are in training for (for example, an emergency medicine resident undertaking a placement in orthopedic surgery; a general practitioner resident undertaking a placement in the hospital pediatrics department). During these placements, residents cross the border

of their own specialty and gain knowledge, skills and insights into a different specialty context. We refer to these placements as out-of-specialty placements.

In most training schemes, both medical specialty residents and primary care residents spend considerable time in out-of-specialty placements<sup>48-53</sup>. General practitioner training schemes, for example, consist of hospital placements for a large or even the largest part of their training program<sup>48,49</sup>. In these hospital wards, residents from different medical specialties and primary care specialties work in close proximity to each other for several months or years.

The skills and competencies needed for intraPC can be formally taught during these out-of-specialty hospital placements<sup>54</sup>, but such formalized intraprofessional learning is currently limited<sup>44</sup>. In order to design intraprofessional learning for residents during their out-of-specialty placements, it is important to align the intraprofessional learning activities with those factors of out-of-specialty placements that contribute significantly to the residents' professional development.

### **Boundary crossing**

Out-of-specialty placements are a special kind of workplace learning that involves boundary crossing. According to Akkerman, the term boundary crossing describes how professionals may need to "enter onto territory in which they are unfamiliar and, to some significant extent therefore unqualified" and "face the challenge of negotiating and combining ingredients from different contexts to achieve hybrid situations"<sup>55</sup>. Individuals who operate in, and across, two or more socio-cultural work contexts are defined as boundary crossers<sup>56</sup>. In out-of-specialty (hospital) placements, at least the primary care residents can be seen as boundary crossers who will experience boundaries when entering the professional domain of medical specialty residents and will face challenges in order to collaborate effectively.

In the boundary crossing theory, constructive engagement with boundaries leads to learning and professional development through four learning mechanisms: (a) identification: discovering what diverse professional practices are about in relation to one another; (b) coordination: creating cooperative and routinized exchanges between professional practices; (c) reflection: expanding one's perspectives on the professional practices; and, (d) transformation: collaboration and co-development of (new) professional practices<sup>55</sup>. If we focus on how boundary crossing learning mechanisms occur during out-of-specialty placements, this could help to stimulate the learning of intraPC in this complex field.

## **Hierarchy and power dynamics**

Physicians have traditionally been trained within a specific specialty. This creates a boundary around accepted types of knowledge with “insiders” and “outsiders”, defined by their ability to navigate the norms of the medical specialty group<sup>57</sup>. Medical contexts, such as hospitals, are intensely hierarchical contexts<sup>58,59</sup> in which intraprofessional hierarchies among medical specialties can be clearly recognized<sup>60,61</sup>. Hierarchy is one of the most fundamental characteristics of social and professional relationships<sup>62</sup>, and power can operate by establishing and maintaining such hierarchies<sup>57,62</sup>. Power dynamics based on traditional medical hierarchies are intrinsic to professional interaction and learning processes<sup>11,26,58,63-65</sup>. We wonder what influence power dynamics have on the learning of intraPC between primary care and medical specialty residents during hospital placements. To date, there is no literature on the power dynamics involved and their impact on intraprofessional learning in these out-of-specialty placements.

## **What can we learn from the COVID-19 pandemic?**

During this research project, the COVID-19 pandemic suddenly emerged and caused a global health emergency<sup>66,67</sup>. The huge influx of extremely ill patients compelled hospitals to establish new COVID and ICU units where many physicians and residents from different specialties had to work together in the same workplace. Working at the ICU or COVID department may be considered as a special form of out-of-specialty placement for residents and supervisors, with this difference that that none of the physicians at first had any specific knowledge of the COVID disease, which developed only gradually over time. To handle the high patient numbers and the complexity of COVID-19 patient care, effective intraPC was needed, and the COVID-19 pandemic thus forced physicians to collaborate intra-professionally. We had the opportunity to evaluate intraprofessional collaboration and learning during a crisis. These lessons can provide insights for the development of intraprofessional learning during postgraduate out-of-specialty placements in non-crisis settings.

## **RESEARCH AIM**

As described before, the need for intraPC learning among residents is high. It is emphasized that postgraduate training will have to “surpass the boundaries of the individual medical specialties” to facilitate intraPC and network development<sup>68</sup>. Guidelines on how to realize and operationalize these ambitions are, however, lacking as evidence of the characteristics and the process of designing and developing intraprofessional learning activities, specifically during hospital placements, is not available.

The overall goal of this research project was to illuminate current intraprofessional collaborative competency development during hospital placements and to uncover opportunities for stimulating the learning of intraPC by residents. The three aims of this thesis were (i) to gain insight into the potential of hospital (out-of-specialty) placements for intraPC learning. (ii) We also wanted to enhance our understanding of context, culture and power dynamics on hospital wards and pave the way for future constructive collaborative learning and practice. (iii) Based on these factors, we aimed to develop evidence-based recommendations for designing postgraduate out-of-specialty placements and design principles for intraPC learning among medical residents during hospital placements and to develop (prototypes of) intraprofessional learning activities.

### **This resulted in the following research questions and goals**

#### **Questions:**

1. What theoretical and/or educational frameworks are used for developing and evaluating postgraduate medical out-of-specialty placements?
2. What factors are relevant for the learning of postgraduate medical residents during out-of-specialty placements?
3. When and how do primary care and medical specialty residents learn intraPC during out-of-specialty hospital placements?
4. What are opportunities for and barriers to intraPC learning during these out-of-specialty hospital placements?
5. What lessons can we learn from the COVID crisis for intraPC learning and the development of adaptive expertise in postgraduate training in non-crisis settings?

#### **Goals:**

6. To explore power dynamics and their impact on intraprofessional learning between primary care and medical specialty residents during out-of-specialty hospital placements.
7. To enhance our understanding of the nature and extent of power dynamics on hospital wards.
8. To develop and substantiate both theory-driven and context-sensitive design principles to guide the development of intraPC educational activities during out-of-specialty hospital placements.
9. To develop (prototypes of) intraprofessional learning activities.

### **Design-based research**

Hospital placements are complex settings that are affected by many factors, including stakeholders from different specialties with their different interests, interpersonal dynamics and delicate collaboration<sup>69-71</sup>. Developing feasible and applicable intraprofessional learning activities in such a complex context requires a systematic approach that integrates theory and engages stakeholders to align theory with practical contexts<sup>71-74</sup>. To

this end, a design-based research approach is useful to, first, formulate theoretical design principles, and, second, to enrich and align these design principles with practice contexts in close collaboration among researchers and stakeholders with different specialties<sup>70,74,75</sup>. Within design-based research, three phases can be distinguished: (I) a preliminary phase, (II) a prototyping phase and (III) an assessment phase<sup>76</sup>.

## THESIS OUTLINE

In phase I (the preliminary phase) of this design-based research project, this thesis provides knowledge of what and how residents actually learn during their hospital placements and what intraprofessional learning improvements are needed, based on a literature review (Chapter 2), based on observations and interviews with primary care residents, medical specialty residents and medical specialty supervisors during hospital placements (Chapters 3 and 4) and based on lessons learned from intraprofessional learning during COVID-19 (Chapter 5).

**Chapter 2** describes a scoping review to explore the factors that are relevant for the learning of postgraduate medical residents during out-of-specialty placements. As we aimed to understand the nature of these placements, based on empirical observations, we only included original studies. A qualitative thematic analysis was performed to identify the factors that contribute to learning during out-of-specialty placements. Theories of workplace learning and boundary crossing were used when analyzing and structuring the results.

**Chapter 3** describes a non-participatory ethnographic research investigating facilitators and barriers to learning intraprofessional collaboration between residents at six hospital departments. We conducted observations and in-depth interviews with the observed primary care and medical specialty residents and supervisors. The observations were used to feed the interview questions. We used a template analysis method to analyze the interviews.

**Chapter 4** describes a study that builds on the study in Chapter 3. This study explores power dynamics and the impact on intraprofessional learning between primary care and medical specialty residents during hospital placements. Using a template analysis, we analyzed the transcripts of observations and interviews. A critical theory paradigm was employed, and a discourse analysis informed the data.

**Chapter 5** describes a qualitative study based on sixteen semi-structured interviews with residents and medical specialists who worked at a COVID department or Intensive Care



Unit during the COVID pandemic. This study focuses on the adaptability and intraPC learning of residents during a crisis. We analyzed the data by using template analysis method.

In phase II (the prototyping phase) of this design-based research project, the research group developed concepts of design principles. In multiple sessions with various stakeholders, these principles were subsequently enriched and refined into a final set of validated theory-driven and context-sensitive design principles (Chapter 6).

**Chapter 6** describes the development and substantiation of a set of twelve theory-driven and context-sensitive design principles for intraprofessional learning among medical residents during hospital placements. Based on the studies in Chapters 2-5, the research team formulated nine theory-driven design principles. To enrich and consolidate these principles, three focus group sessions with stakeholders were conducted using a Modified Nominal Group Technique. After that, we conducted two work conferences to test the feasibility and applicability of the design principles for developing intraprofessional educational activities and to sharpen the principles linguistically.

In phase III (the assessment phase), researchers together with stakeholders and patients /caregivers developed and elaborated prototypes of educational activities based on the design principles (see also Chapter 6).

## RESEARCH CONTEXT

The studies described in this thesis were conducted in the Netherlands. After a six-year undergraduate medical education program, almost all students who graduate from medical school apply for postgraduate training programs in one of 33 medical care specialties (4 to 6 years), primary care specialties (3 years), or public health and a few other specialties (2 to 4 years). Both primary care training and medical specialty training take place in a setting where residents predominantly learn on the job.

### Primary care postgraduate training

General practitioners and elderly care physicians training in the Netherlands take a three-year competency-based program that is founded on the CanMEDS framework (Canadian Medical Education Directives for Specialists). Each of the seven University Medical Centers (UMCs) in the Netherlands offer general practitioner training, and five of them also offer elderly care physician training. In years 1 and 3 of the primary care training program, residents provide patient care in a general practice or a nursing home under the supervision of a designated supervisor. In year 2, primary care residents undertake

placements in hospitals (6-9 months), nursing homes (general practitioner residents) and psychiatric outpatient clinics with different supervisors. During their out-of-specialty hospital placements, primary care residents work together with medical specialty residents from different specialties in the same department. The primary care residents' program consists of four days of practice a week. The fifth day is an academic day spent with fellow primary care residents at the university's training institute.

### **Medical specialty postgraduate training**

Medical specialty training in the Netherlands involves a four- to six-year competency-based program that is also based on the CanMEDS framework, consisting of seven competency fields constituting the profile of a competent physician. Medical specialty residents provide patient care in a hospital, sometimes at different departments, under the supervision of a designated supervisor. The program consists of five days of practice a week. Medical specialty residents get the (limited) opportunity to take courses alongside their clinical work.

### **Intraprofessional learning during out of specialty placement of PC residents in hospitals**

In the Netherlands, primary care residents complete at least a six-month out-of-specialty hospital placement, particularly at geriatrics departments and emergency departments. The observations and interviews with primary care residents, medical specialty residents and medical specialty supervisors were conducted during hospital placements at three geriatrics departments and three emergency departments of five Dutch hospitals. The interviews with residents and supervisors during COVID-19 were conducted online with participants from ten different hospitals in the Netherlands. The focus group sessions and work conferences with stakeholders (primary care residents and teachers, medical specialty residents and supervisors, educationalists, researchers, patients and caregivers) were conducted at the Radboud University Medical Center or online in the Netherlands.

## **RESEARCH TEAMS AND REFLEXIVITY**

Conducting design-based research requires a research team in which different specialties, experiences and areas of expertise are represented. The research teams of the respective studies consisted of different combinations of researchers. Prior to each study, the areas of expertise that were needed to conduct the study were identified. Each research team included members with different academic backgrounds and multiple professions, all with extensive experience in postgraduate medical education and in educational, qualitative and/or quantitative research: a psychologist, educational scientists, general practitioners, a director of the primary care specialty training program, a curriculum coordinator of

the general practice specialty training program, a general practice specialty teacher, a geriatrician, a pediatrician and program director of the pediatric specialty training program, an internist and program director of postgraduate medical specialty education, a philosopher and medical students.

Some professionals were working as supervisors, teachers or coordinators of out-of-specialty placements. To optimize the studies for postgraduate training, the first author regularly shared interim results with the research team members in their roles as researchers and as stakeholders to understand whether and how the findings resonated with their experiences in out-of-specialty placements. The authors acknowledge that their background assumptions and perspectives have influenced their data collections and interpretations. Particular time and attention was, therefore, paid to reflexivity in each study and throughout the entire design-based research project.

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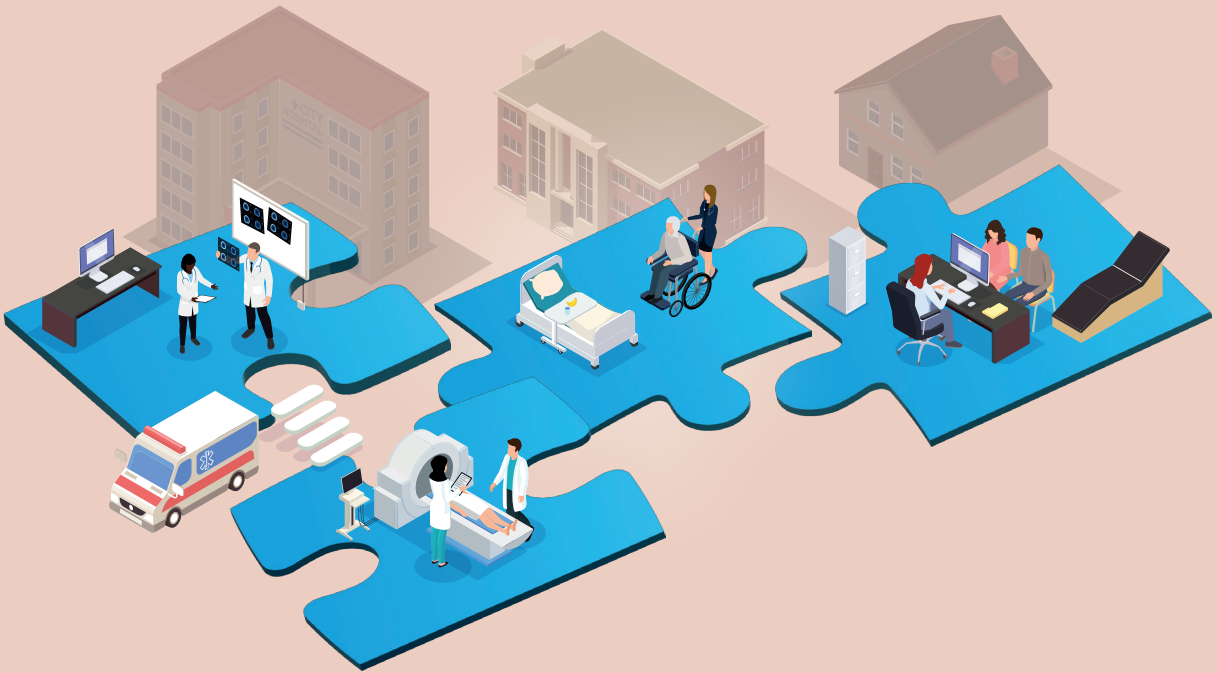




*“Education is the  
most powerful  
weapon  
which you can  
use  
to change the  
world”*

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**Nelson Mandela**



# CHAPTER 2

## Optimizing learning during postgraduate medical out-of-specialty placements: a scoping review

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Submitted

# **ABSTRACT**

## **Context**

Out-of-specialty placements (OSPs) are widely used in postgraduate medical education. Temporarily working and learning in a different but related specialty has several presumed benefits for trainees. However, there is a lack of empirical evidence on the optimal structure of OSPs, and there are signs that OSPs are not optimally used. This scoping review aimed to identify factors relevant for learning during OSPs to develop evidence-based recommendations for designing OSPs.

## **Methods**

PubMed, WebofScience, PsycINFO and ERIC were searched to identify empirical articles. We extracted data by inductively coding, after which a thematic analysis was performed. Theories of workplace learning and boundary crossing were used when analysing and structuring the results.

## **Results**

Of the included 40 articles, we identified six themes regarding factors relevant to learning during OSPs: learning methodology, trainee motivation, supervisor orientation and commitment, learning climate, organizational aspects and connection between professional contexts. Supervision and feedback tailored to the OSP trainees' learning/specialty needs are crucial factors that facilitate learning. Disconnection between trainees' professional context and OSP's professional context inhibits learning. Analysis of results led to an adjusted version of the 3-P model of workplace learning.

## **Conclusions**

OSPs have the potential to enhance trainee development, but the learning opportunities are often not optimally used. Learning during OSPs can be optimized if 1) trainees and supervisors clearly understand both trainees' specialty context and the OSP's context, 2) placement schedules provide exposure to experiences relevant for trainees, 3) supervision and feedback are tailored to the trainees' educational needs and 4) intraprofessional collaboration is explicitly addressed.

## BACKGROUND

Worldwide, postgraduate medical trainees frequently undertake traineeships in other specialties during their specialization, while little is known about the quality of these traineeships<sup>1-5</sup>. We refer to those traineeships as out-of-specialty placements (OSPs). The reasons for offering OSPs during postgraduate training are hardly ever made explicit, but in general, they are meant for gaining clinical experience in an environment with a high prevalence of specific diseases<sup>3,6</sup>. Preconceptions about their presumed benefits have become ubiquitous, despite a lack of empirical evidence on the optimal timing, structure and nature of these placements<sup>2,4,5,7</sup>.

Evidence suggests that OSPs are not utilized optimally<sup>5,7,8</sup> and that gaining knowledge may unwantedly stagnate towards the end of them<sup>9</sup>. OSPs often lead to suboptimal educational experiences because little attention is given to their structure and quality, thus leading to unclear learning outcomes<sup>5,8,10</sup>. One area in which OSPs are common is during postgraduate training for general practice (GP)<sup>2,6,11</sup>. Pereira Gray recognized as early as in 1977 that there was a worrisome gap between the existing learning needs of GP trainees and their actual learning experiences during hospital placements<sup>12</sup>. Subsequently, there have been multiple calls from GP trainees and course organizers showing dissatisfaction with OSPs over the past few decades<sup>11,13-15</sup>. Although propositions have been made to adjust curricula, most GP training schemes globally still consist of OSPs for a large or even the largest part of their training programme<sup>2,6</sup>. Most training schemes of other medical specialties also largely consist of OSPs<sup>1,4,5,10</sup>.

As evidence-based guidelines on how best to organize OSPs in postgraduate medical training are lacking,<sup>2,5</sup> it is unclear what aspects of OSPs considerably contribute to the professional development of trainees. OSPs are a unique kind of workplace learning that involves boundary crossing and inter- and intraprofessional learning; trainees cross the border of their own specialty and learn from, with and about other professions (interprofessional learning) and from, with and about other disciplines within a single profession (intraprofessional learning, e.g., involving different doctors such as general practitioners and paediatricians)<sup>16</sup>. Possible explanatory theories and processes for optimizing learning during OSPs are, therefore, those of workplace-learning<sup>17,18,20-23</sup> and boundary crossing<sup>19</sup> (see Box 1). A first step in accomplishing optimization of OSPs is to know what factors contribute to learning during these placements. Therefore, we first need to explore pertinent literature on factors that are relevant to learning during OSPs.

Scoping reviews assess the relevance of studies in relation to a broad research question. They represent a methodology to map existing evidence on a specific topic that is emerging<sup>24-27</sup>. As literature on the topic of OSPs focuses on diverse interventions,

programmes, approaches and methodologies, a scoping review seemed appropriate to obtain comparative insights<sup>28</sup>. Our purpose in conducting a scoping review was to investigate the nature and scope of available research activity, to summarize and disseminate research results and to outline what is already known and identify gaps in the existing literature<sup>24,28</sup> regarding learning during OSPs. This led to the following research questions:

1. What theoretical and/or educational frameworks are used for developing and evaluating OSPs?
2. What factors are relevant for the learning of postgraduate medical trainees during OSPs?

Based on these factors, this scoping review aims to develop evidence-based recommendations for designing OSPs.

#### Workplace learning and boundary crossing in relation to OSP

Workplace-based learning theory shows that learning while working occurs mainly informally through clinical activities and direct experiences, followed by processes of interpretation and construction of meaning<sup>20,21</sup>. Simultaneously, interacting with supervisors, inter-/intraprofessional colleagues, peers and others is important. Workplace-based learning can be seen as the outcome of social processes, in which social participation is essential<sup>17,18,20-22</sup>, and as the outcome of collaborative processes, in which shared responsibility between supervisors and trainees is essential<sup>20,22</sup>. During 'traditional' workplace-based learning, trainees are trained by way of apprenticeship models,<sup>23</sup> in which supervisors are their role models of the same specialty. OSPs, however, are a unique kind of workplace-based learning, because OSP trainees are in training for a different specialty, which means that supervisors are role models from within a different context and specialty. An OSP is a learning experience in a different clinical and socio-cultural work environment in which trainees cross the border of their own specialty and gain knowledge, skills, and insights that they need to transfer to their own (or future) specialty context.

Working in a different socio-cultural environment has been defined by Akkerman (2011) as boundary crossing<sup>19</sup>. Constructive engagement with boundaries leads to learning and professional development through the following four learning mechanisms: identification, coordination, reflection and transformation.<sup>19</sup> To gain an understanding of how OSPs function and how they could be supported, we have used these theories about workplace-based learning and boundary crossing as a lens to analyse, structure and interpret the results.

**Text Box 1.** Workplace learning and boundary crossing in relation to OSP



## METHODS

In conducting this study, we used a qualitative analysis method as this was in line with our research question. We followed the six steps from 'Arksey and O'Malley's methodological framework for conducting a scoping study' as updated by Levac et al.: 1. Identifying the research question; 2. Identifying relevant studies; 3. Study selection; 4. Charting the data; 5. Collating, summarizing and reporting the results; and 6. Consultation (optional)<sup>26</sup>. To ensure the rigour of this research, we used the reporting guideline Preferred Reporting Items for Systematic Reviews and Meta-Analysis Extension for Scoping Reviews (PRISMA-ScR) as designed by Tricco et al. in 2018<sup>29</sup>. This guideline is consistent with the Joanna Briggs Institute (JBI) guidance for scoping reviews.

### The research question

We aimed to provide information on factors relevant for OSP learning, which could improve the development and content of postgraduate training programmes and the value of OSPs. This could help to optimize the learning outcomes and professional development of trainees. Our aim led to the following research questions: 1. What theoretical and/or educational frameworks are used for developing and evaluating OSPs? 2. What factors are relevant for the learning of postgraduate medical trainees during OSPs?

### Identifying relevant studies

Two authors (NL and LV) identified search terms through background searching in PubMed, Google Scholar and relevant journals. We conducted the initial searches in PubMed, Web of Science, ERIC and PsycINFO in 2019. A specialized research librarian helped the authors to design the search strategies, which resulted in different search strings. We combined the following search terms, accompanied by various synonyms: 1] trainee, 2] rotation, 3] learning, 4] medical, 5] interprofessional, 6] social identity or cognitive apprenticeship and 7] boundary crossing or off-service. The process was iterative, allowing us to refine search terms and to find additional articles by snowballing on references of included articles. The final searches were run on August 19, 2020 (see Appendix 1).

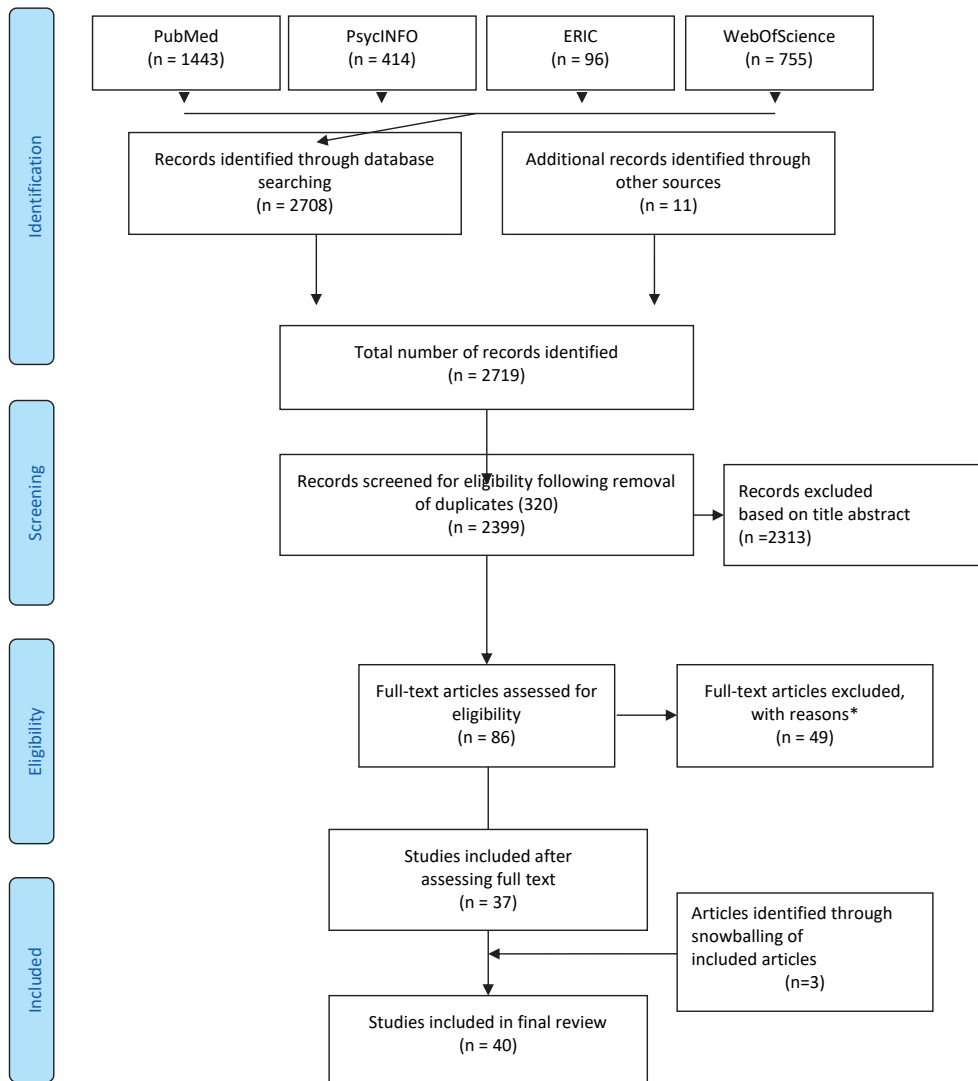
### Study selection

Articles obtained by the above-mentioned searches were uploaded in Endnote to perform the in- and exclusion process (n=2709). Additional references identified through journal hand searching (n=11) were also uploaded in Endnote. After merging and deduplication, two authors (NL and LV) independently screened the articles on title and abstract (n=2399). The authors then assessed the full-text articles to determine eligibility (n=86). Articles identified through snowballing of included articles were also uploaded in Endnote (n=3). Authors discussed disagreements, and if there was any ambiguity about whether an article should be included or not, the research team was consulted to achieve consensus and

ensure consistency of approach. Table 1 describes the eligibility criteria that were used for our exploration of the research literature. We included original articles published in English, French, German or Dutch between 1/1999-8/2020 that focused on academic postgraduate medical trainees who are specializing in a particular medical field, or trainees taking an out-of-specialty traineeship in a medical institute such as a hospital or elderly home. We included original research studies of any design: qualitative, quantitative, mixed-methods research studies and reviews because we were looking for a broad empirical substantiation of the factors relevant for effective learning during OSPs. As we aimed to understand the nature of OSPs, based on empirical observations, we did not include any other publication types<sup>27</sup>. Articles published before 1999 were excluded because the results described would not be recent enough to be generalized to current medical education. Based on the abstracts, many articles were excluded because the eligibility criteria were not met. We defined OSP as a traineeship in which trainees participate in a specialty from other ‘Specialist Sections and Divisions’ as defined by the European Union of Medical Specialists (UEMS)<sup>30</sup> or in another Primary Care Specialty (e.g., general practice, elderly care practice, military medicine, hospice) than the chief specialty they are in training for. OPS refers only to a rotation in a specialty that the trainee will never pursue. In the end, 40 studies were identified for inclusion in the final review (see Figure 1 and Appendix 2).

<b>Eligibility criteria</b>	
<b>Inclusion criteria</b>	<b>The following articles were included:</b>
	Published between 1/1999-8/2020
	Published in English, French, German or Dutch
	Focuses on academic postgraduate medical trainees who are specializing in a particular medical field
	Trainees are taking an out-of-specialty traineeship
	The traineeships take place in a medical institute such as a hospital or elderly home
	Original research studies
	Studies of any design: qualitative, quantitative or mixed-methods studies Literature reviews
<b>Exclusion criteria</b>	<b>The following articles were excluded:</b>
	Published before 1999
	Published in a language other than either English, French, German or Dutch
	Focuses on postgraduates who are not yet specializing
	No full text available Chapters of books, conference papers, white papers, letters or expert opinions

**Table 1.** Eligibility criteria



**Figure 1:** Scoping review flow chart of the data collection and article selection process.

ERIC = Educational Resources Information Centre

\* Of the 49 articles that were excluded based on full text, 22 were not about out-of-specialty placements, 9 did not consider factors relevant to learning, 6 were not about traineeships but about education, 4 did not meet the criteria for out-of-specialty-placements, 1 was not about trainees, 2 were about postgraduates who were not yet specializing and 5 were not empirical.

### Charting the data

The qualitative data were charted and analyzed iteratively. We inductively generated a preliminary set of codes<sup>31</sup> by reading each study line by line, making notes, charting key observations and revisiting the text to extract the key ideas, concepts and messages,

based on the research question. We noted the learning outcomes of the OSPs as additional information. In coding the articles, we focused on both the findings and the authors' description of the observed findings. NL and LV first coded two articles independently, then compared the results and created a preliminary code tree which was first discussed with CF, an educationalist and researcher in the field of workplace-learning, and then by the research team. Subsequently, six authors (NL, LV, CF, NS, BT, KV) coded the articles using this tool. Each article was coded in ATLAS<sup>31</sup>.TI by at least two authors in different combinations to ensure conformity, with NL analysing all 40 articles. If new codes were identified, they were discussed in the research team. We performed a quality assessment of the articles to take their methodological quality into account during analysis<sup>26,28</sup>. The methodological quality of each paper was assessed by two members of the research team in various combinations who filled out and discussed the JBI Critical Appraisal Checklists for Qualitative Research, Cross-Sectional Research, Cohort Studies or Systematic Reviews and Research Syntheses<sup>32</sup> (see Appendix 3).

### **Collating, summarizing and reporting the results**

We performed a thematic analysis as this was a suitable method to answer our research question<sup>31,33,34</sup>. Each of the quantitative articles in this scoping review evaluated diverse, individual programmes, which made performing one overarching quantitative synthesis impossible. However, the Results and Discussion sections of these papers revealed relevant qualitative data to answer our research question. We chose, therefore, to include these qualitative data in the synthesis of our qualitative analysis<sup>31</sup>. After we analysed all articles, the codes were organized into overarching categories and then further structured into major themes. We used theories of workplace learning and boundary crossing during coding and research team discussions and while analysing and summarizing our findings. During our discussions of the findings, Tynjälä's 3-P model of workplace-learning proved to be useful as this model summarizes the presage, process and product components in a sociocultural learning environment, including the technical–organizational environment<sup>35</sup>.

### **Research team and consultation**

The research team comprised members from different academic backgrounds and multiple professions<sup>27</sup>, all with extensive experience in postgraduate medical education and in educational, qualitative and quantitative research: a psychologist and teacher in postgraduate primary care and medical specialty training (NL), an educational scientist in workplace-learning (CF), a GP and curriculum coordinator of GP specialty training (BT), a GP and GP specialty teacher (KV), a pediatrician and programme director of pediatric specialty training (JvdV), an internist and programme director of postgraduate medical specialty education (JdG), a GP and director of primary care specialty training (NS), a GP and educational scientist (AK) and a medical student (LV). Part of our research team were health professionals working as supervisors, teachers or coordinators of OSPs.

To optimize this scoping review for postgraduate training, we shared interim results with these professionals as stakeholders to understand whether and how the findings resonated with the stakeholders' experiences in OSPs. All stakeholders confirmed that the findings were consistent with their experiences; two provided suggestions to stress the discrepancy between the mandatory placement goals and trainees' learning needs; one provided suggestions to extract data on intraprofessional collaboration as a learning goal/outcome. We have incorporated these suggestions into our results and discussion.

## RESULTS

### Study characteristics

A total of 40 articles were included (Figure 1). One article was published in French<sup>36</sup>, and 39 in English<sup>1,3,4,7,8,10,11,14,15,37-66</sup>. All articles were published in academic medical or educational journals; the majority of the included articles were published in the UK<sup>1,11,15,40,45,50,53,54,60,63</sup> (n= 10) and the USA<sup>3,4,7,8,39,43,44,47-49,51,56,59,61,62,64,65</sup> (n= 17). In terms of study design, 1 article was a systematic review<sup>62</sup>, 9 were qualitative<sup>1,7,11,15,38,52,53,55,58</sup>, 13 were quantitative<sup>3,10,36,39,41,43-46,48,57,65,66</sup>, 17 were mixed methods<sup>8,14,18,37,40,42,47,49-51,54,56,59-61,63,64</sup> (see Appendix 2). The majority of the mixed methods articles (n= 12) focused on qualitative analysis<sup>37,40,42,49-51,54,56,59-61,63</sup>. The quality of qualitative articles was largely good. The quality of quantitative articles was generally moderate to poor (see Appendix 3).

### Theoretical and/or educational framework used in OSP articles

The majority of articles evaluating OSPs, 14 out of 40 (35%), used theories of workplace-based learning (workplace learning, workplace based assessment or learning by exposure)<sup>15,43,44,46,49,52-54,56-58,60,61,65</sup>. A total of 11 articles (27,5 %) used an educational framework of inter-/intraprofessional education (inter-/intraprofessional collaboration and learning, interdisciplinary collaboration/ team learning, integrated care, integrated teamwork)<sup>1,7,36,41,46-48,50,52,58,65</sup>. A total of 11 articles (27,5%) did not use or state any theoretical or educational framework at all<sup>3,4,11,14,37-40,59,62,66</sup> (See appendix 2)

### Factors relevant for learning

While investigating factors relevant for OSP learning, we found many factors that are also known to be factors for workplace-learning in general, such as 'supervised learning'. We intentionally focused on characteristics of these that were *specific* for OSPs. These characteristic factors could be organized into six major themes: 1) learning methodology; 2) trainee motivation; 3) supervisor orientation and commitment; 4) learning climate; 5) organizational aspects and 6) connection between professional contexts.

### **Theme 1: Learning methodology**

Formal and informal learning were seen as important ways of learning<sup>8,38-40,44,48,49,51,52,54,56,57,61,62,64,65</sup>, and supervision and (verbal) feedback were frequently mentioned as being the most vital for learning during OSP<sup>15,37,40,50,51,53,55,58,60,61,63,64</sup>.

Five articles, however, reported that OSP trainees received no supervision or feedback and are sometimes even excluded from formal learning moments because they are not considered as part of the team<sup>3,10,14,37,38</sup>.

*'...rotating residents do not "deserve" didactic education because they are not long-term members of the Emergency Department [ED]-team or because they do not see a significant proportion of ED patients'<sup>3</sup>.*

### **Theme 2: Trainee motivation**

For OSP learning to be effective, the OSP trainees' attitude and motivation appeared to be relevant as trainees are often expected to identify and fulfil their own learning goals<sup>3,14,15,37,50,52,53,57,61</sup>.

*'My ST1 [GP-trainee in hospital] was pro-active in seeking every possible opportunity to learn and gain GP experience while in post [integrated training post integrating primary and secondary care]'<sup>50</sup>.*

However, OSPs are often mandatory and aiming at educational goals and objectives that trainees do not always appear to understand<sup>36,37,53,63</sup>. Consequently, it is difficult for OSP trainees to know what to expect and how to steer their learning process.

*'The trainees should recognize the training outcomes and expectations and hence respond with their needs so as to enhance the achievement of the program's goals and objectives'<sup>37</sup>.*

### **Theme 3: Supervisor orientation and commitment**

A considerable part of learning, both formal and informal, occurs via supervision. It is important, therefore, that supervisors have sufficient competencies for observing OSP trainees on their specialty objectives, which is not always the case<sup>37,53,60</sup>. In order to tailor the supervision and feedback to the OSP trainees' learning needs, it is also important that supervisors understand the context of the trainees<sup>14,15,37,38,45,60,63</sup>. It was indicated in eight articles, however, that supervisors were unfamiliar with the context, curriculum and the standards of the trainees' specialty<sup>8,14,15,38,66</sup>, often leading to inapplicable feedback and unmet educational needs<sup>3,8,14,38,39,45,66</sup>. Awareness of formal placement objectives can help identify the OSP trainees' educational needs<sup>1,3,4,10,45,64</sup>. Moreover, supervision appeared to occur more frequently when the contexts were understood<sup>63</sup>.

*'When the supervisor understands the process with the [GP-]trainee, and understands what the expectations are for the ARCP [Annual Review of Competence Progression], then it [supervision] is more likely to occur'<sup>63</sup>.*

#### **Theme 4: Learning climate**

The work-learning climate appeared to be a critical factor in learning. A supportive learning environment with (intraprofessional) collaboration is a positive driving force for learning during OSPs.

*'What GPs found useful in their Paediatric teaching [...] was a supportive learning environment, particularly one where questions were encouraged, where good team working was in evidence, and where there was a balance between supervision and responsibility [...] Particularly valued was evidence of a good primary secondary care interface'<sup>54</sup>.*

The learning climate is largely influenced by supervisors. Their attitude towards OSP trainees was considered essential for the relationship between supervisors and OSP trainees, the presence of hierarchy and the opportunities for learning<sup>3,8,14,15,37,38,45,50,52,58,59,63</sup>.

*'Supervisors and residents [from different specialties] mentioned that the way medical specialists speak about primary care doctors can be responsible for creating a (un)safe work-learning climate'<sup>52</sup>.*

*'...the attending physicians [during orthopaedic surgery rotation] rarely acknowledged my [Emergency Medicine-resident] presence and they did not teach'<sup>8</sup>.*

*'The factors contributing to these inadequacies [in OSPs of primary health care trainees in internal medicine and paediatrics] may be related to many factors including [...] personal attitudes of some hospital consultants who still regard primary health care career as inferior'<sup>14</sup>.*

#### **Theme 5: Organizational aspects**

Organizational factors, such as the availability of appropriate work-learning resources for OSP trainees<sup>3,37,38,50,66</sup>, the structure of rotation and tasks and the workload of both trainees and supervisors are of major importance as they influence exposure and learning opportunities relevant for OSP trainees<sup>1,3,4,10,15,37,38,40,45,46,50-53,55,56,58,60,63</sup>. OSP funding difficulties<sup>43</sup> and unclarity of the OSP purpose as indicated by the organization or supervisors also contributed to lack of exposure and learning opportunities. In several articles, suggestions were made to adjust the OSP schedule to provide exposure to experiences that were relevant for OSP trainees' (future) profession<sup>8,10,37,38,49,50,66</sup>:

*More time in [primary care sport medicine] clinic with a focus on how to manage these patients in the emergency department would be more useful. In-house time*

*is mostly spent doing floorwork, which has some benefit, but becomes less so after 4 weeks<sup>48</sup>.*

*'Emphasis will remain on enabling interns to have meaningful patient encounters as part of a multidisciplinary approach to clinical care. [Paediatric] Residents should learn the indications for a referral to genetics and also be able to order appropriate standard genetic testing<sup>49</sup>.*

Another important way of OSP learning supporting experiences relevant for trainees' own professional contexts is through longitudinal placements, integrative placements in which trainees work in their own specialty context for at least one day a week<sup>38,50,55</sup>, and placements with a focus on integrated (interprofessional) care<sup>1,7,41,49,52,58,62</sup>. In such placements, trainees can learn from different perspectives while remaining part of an inter/intraprofessional team and stay connected with their own professional context.

*'Placement [OSPs for psychiatrists in medical specialties] emphasized the need for better collaboration with medical colleagues in managing people with long-term conditions<sup>1</sup>.*

*'The integration of subspecialties [in Longitudinal Integrated Blocks where residents move frequently between different settings] also had compelling impacts on learning. Opportunities to apply learning to a clinical context, compare and contrast perspectives, and examine a problem through different lenses led to the construction of knowledge in a way that felt more durable to participants<sup>7</sup>.*

Recommendations are also made to increase learning by integrating specialties into interdisciplinary models during OSPs. Assessment tools for this way of learning have yet to be developed.

*'For young residents, working in an interdisciplinary model [emergency department] implies to practice in an emerging specialty that they might not have chosen. Hence, there is no official assessment method allowing residents to give a feedback of their work in the ED<sup>36</sup>.*

## **Theme 6: Connection between professional contexts**

The connection with trainees' own professional context was considered a crucial factor for OSP learning.

*'One GP trainee [integrated GP training placement] said: "I was able to balance the paediatric patients I saw in hospital with those in general practice, allowing a direct comparison"<sup>50</sup>.*



Disconnection between trainees' context and OSPs' context proved to be an important barrier to obtain relevant learning experiences that contributed to integrating into one's own specialty training<sup>8,14,38,39,45,66</sup>.

*'They felt that a significant proportion of the learning and experiences that they gained had little relevance to their future role as a general practitioner'<sup>45</sup>.*

To connect the contexts, nine authors noted the importance for OSP trainees to maintain contact with their original specialty by involving consultants of their own specialty during placements<sup>11,15,37,60</sup>, for example, or by having release days with OSP trainees learning amongst their peers and role-models at their own specialty training institute<sup>14,38,50,52,55</sup>. To harmonize feedback and assessment, it would be beneficial to have collaboration between supervisors from both contexts to coordinate training events and to have more regular communication about trainees<sup>11,14,15,37,38,50,51,53,55,59</sup>. In addition, the connection between professional contexts would also be fostered by using assessment forms specific to the OSP trainees' context and by discussing the knowledge and skills obtained during the OSP in the context of the trainee<sup>38,60</sup>.

*'It has been suggested that Family Medicine trainers should also discuss the knowledge gained in hospitals in the context of primary health care and there should be some joint teaching seniors from both hospital consultants and family medicine trainers'<sup>38</sup>.*

### **Learning outcomes**

The learning outcomes that were the result of OSPs could be organized into three main groups: 1) medical competency: obtained medical knowledge and skills, improved confidence in managing clinical cases, 2) changed attitude towards other specialty and its patients: increased interest in and more positive attitude towards the OSP specialty and their patients, deeper perception of the OSP specialty, and 3) improved inter-/intraprofessional collaboration: established interprofessional relationships and knowledge, skills, and collaboration acquired from interprofessional relationships during OSP(see Table 2).

Learning outcomes of out-of-specialty placements		
<b>Medical competency</b>	<ul style="list-style-type: none"> <li>- Medical knowledge</li> <li>- Medical skills (communication and physical examination skills)</li> <li>- Confidence in managing clinical cases</li> </ul>	<p><b>Example</b></p> <p><i>'Level of comfort in [IM resident] dealing with cancer patients and patients at end of life was also significantly improved [...] No improvements were observed in dealing with the approach to diagnosis, complications of treatment, and oncologic emergencies'<sup>57</sup></i></p>
<b>Changed attitude towards other specialty and its patients</b>	<ul style="list-style-type: none"> <li>- More positive attitude</li> <li>- Greater interest in other specialty</li> <li>- Deeper perception of other specialty</li> </ul>	<p><i>'IM residents reported that their experience enhanced their awareness of geriatrics and left a lasting impression on how they would care for older patients'<sup>61</sup></i></p>
<b>Improved inter-/intraprofessional collaboration</b>	<ul style="list-style-type: none"> <li>- Building interprofessional relationships</li> <li>- Learning from interprofessional relationships (knowledge, skills and collaboration)</li> </ul>	<p><i>'Systems-based practice rotation helped me [IM-resident] better understand the resources available outside of the hospital and also in the hospital including nutrition, pharmacy, which, in turn, improved the patient care across the continuum'<sup>47</sup></i></p>

**Table 2.** learning outcomes of out-of-specialty placements

## DISCUSSION

### Principal findings

With this study we reviewed empirical evidence on learning in OSPs. This is important as most postgraduate training schemes worldwide offer OSPs as a large part of the training programmes. We found that OSPs have the potential to enhance learning that improves the expertise of OSP trainees in their own specialty, such as medical competency, attitudes towards other specialties and its patients and inter-/intraprofessional collaboration. However, this learning is often sub-optimal and there is room for improvement. Our scoping review revealed characteristic factors specifically relevant for learning during OSPs which are categorized into six main themes: 1) learning methodology; 2) trainee motivation; 3) supervisor orientation and commitment; 4) learning climate; 5) organizational aspects and 6) connection between professional contexts. Disconnection between the professional context of the trainees and that of OSPs was highlighted as a significant factor inhibiting learning. Supervision and feedback tailored to the OSP trainees' learning needs was highlighted as a crucial factor in facilitating learning.

## Supervision and feedback tailored to OSP trainees

Optimal workplace-learning requires the supervisors' and trainees' shared responsibility for the learning process<sup>20,22</sup>. OSPs, however, are unique forms of workplace-learning in which OSP trainees cross boundaries of their own professional practice into a new community of practice and supervisors work in their own practice domain. In OSPs, supervisors and OSP trainees not only have different professional backgrounds with specific socio-cultural aspects but also different hierarchical positions. Supervisors, who operate in their own domain, have a superior position<sup>67</sup> and OSP trainees, who are considered temporary or not part of the team, have an inferior position, often ranked lower than the placement's own specialty trainees. Consequently, OSP trainees have limited influence on meeting their educational needs during OSPs. Given the different professional backgrounds, the hierarchical relationship, and the fact that tailored feedback to trainees is vital to facilitate learning, it would be particularly important for supervisors in OSPs to realize and understand the trainees' professional context and to take responsibility for initiating discussions with OSP trainees about what they learn or do not learn in supervision<sup>67</sup>.

## Connecting professional contexts of trainees and OSPs

This scoping review indicates that the development of knowledge and skills obtained during OSPs will be more advanced if attention is paid to the relevance and the transfer of this knowledge into the trainees' own specialty context. Our findings are in line with theory about workplace-learning and boundary crossing<sup>17,19,20</sup> and fit in with the existing 3-P model of workplace-learning as presented by Tynjälä<sup>35</sup> (Figure 2). The three P's in this model stand for *presage*, *process* and *product*<sup>35</sup>. For the learning *process* to occur, several conditions must be met, referred to as the *presage* in the 3-P model, which will eventually lead to learning outcomes, or the *product*. If we connect this model to our findings, the *presage* consists of learner factors (theme 2 of our results) and the learning context (themes 3 to 5 of our results). For OSPs however, at least two learning contexts are in place for OSP trainees: the trainees' original professional context and the context of the OSP. OSP trainees can be seen as boundary crossers during OSPs, and the two contexts will influence the *process* and the *product*, as a prior reference frame has a significant influence on subsequent learning<sup>20</sup>. Yet, little attention has been given to connecting these two contexts (theme 6 of our results). This is also reflected in appendix 2, where it becomes clear that the reviewed articles do not use boundary crossing as a theoretical framework. To highlight the aspects of boundary crossing and the importance of connecting the contexts, we adjusted the 3-P model by adding the learning context into the 'original professional training context of the learner' and the 'learning context of out-of-specialty placement' (Figure 2).

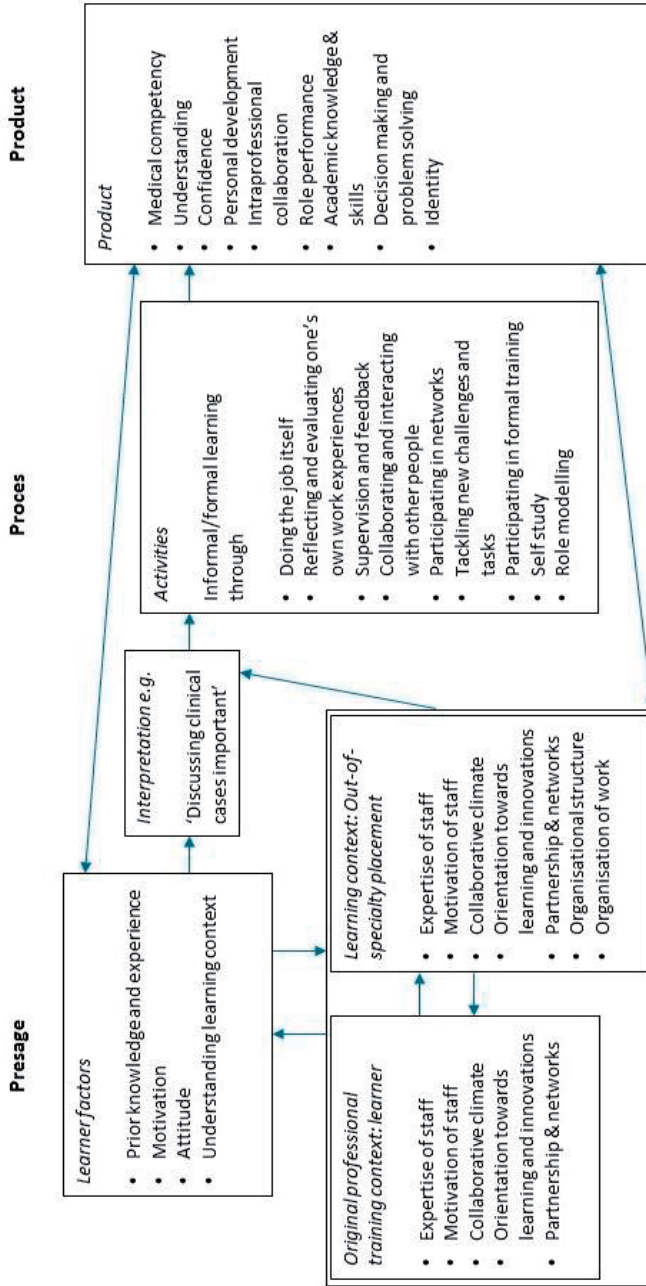


Figure 2: The extended 3-P model of workplace learning for out-of-specialty placements (based on Tynjälä 2010<sup>35</sup>)

## **Intraprofessional collaboration**

The reviewed literature describes several ways to promote connections with trainees' specialty context: adjusting OSP schedules into experiences relevant for the OSP trainees' learning goals<sup>8,10,37,38,49,50,66</sup>; longitudinal or integrative placements in which OSP trainees partially work in their own context<sup>38,50,55</sup>; and placements with a focus on integrated inter-/intraprofessional care<sup>1,7,41,49,52,58,62</sup>. While transitions of responsibility for patients care are commonplace, communication between current and transferring doctors hardly ever occurs<sup>68</sup>. This argues for placements that focus on integrated intraprofessional care, with activities in which individuals and their context interact in a manner that provides new knowledge and a new sense of understanding<sup>1,68</sup> and transformation of common practice<sup>19</sup>. Through the lens of boundary crossing theory, such manner would include deliberate use of boundary objects and the promotion of related learning mechanisms: identification, coordination, reflection and transformation<sup>19</sup>.

During OSPs, trainees work with professionals who are their future colleagues. However, intraprofessional collaboration could be addressed more often,<sup>1,47,52,56</sup> which has also been concluded in other studies<sup>52,69</sup>. Merlo and Benjamin noted that when anesthesiologists and surgeons spend time rotating on each other's services, they develop a mutual respect for each other's expertise and foster intraprofessional communication and collaboration<sup>69</sup>. The best time to develop and sharpen these skills could be during OSPs<sup>69</sup>.

## **Limitations**

This study has some limitations. As there was no overarching search term for 'OSP', it proved difficult to build a search string that comprised our eligibility criteria. We have minimized the likelihood of missing important literature by consulting a specialized librarian and performing a broad search in various databases. A recurring criticism is that scoping studies usually do not assess the quality of evidence. In order to improve credibility, we performed a quality assessment of the included literature to take its quality into account in our interpretation of the results<sup>26,28</sup>. A finding here was the fact that the included articles were of diverse quality: qualitative articles were largely of good quality, but quantitative articles were generally of moderate to poor quality. As our research questions required a qualitative approach, we dealt with this by qualitatively analysing the articles and coding the findings and the authors' descriptions of the observed findings. In this way, we attempted to catch as much information as possible on this sparsely mined knowledge domain.

## **Implications for practice and future research**

Designing OSPs and maximizing OSP learning should be a deliberate process. Based on this scoping review, we make the following recommendations: OSPs are unique forms of workplace-learning and supervisors have an important role in optimizing learning during

OSPs, for example by making a clear and visible connection between the specialty context of the trainee and that of the OSP, by providing feedback tailored to the trainees' future profession, by including OSP trainees into formal and informal learning activities, and explicitly addressing intraprofessional collaboration during OSPs. For an overview of possible recommendations, see Table 3.

<b>Factors to consider when designing and maximizing learning in OSPs</b>	
<b>Learning methodology</b>	<p>Have a clear philosophy on formal and informal learning and teaching during the OSP.</p> <p>Have a clear philosophy on whether and how (formal) education is provided to OSP trainees as temporary team members.</p> <p>Have a clear view on OSPs' educational goals.</p>
<b>Trainee motivation</b>	<p>Have trainees understand the educational goals and objectives of the OSP<sup>36,37,53,63</sup> so they know what to expect and how to guide their learning process.</p>
<b>Supervisor orientation and commitment</b>	<p>Have all supervisors understand the OSP trainees' context, curriculum and protocols.</p> <p>Train all supervisors to give feedback that is tailored to the OSP trainees' future profession<sup>38,53,63</sup>.</p> <p>Pay attention to assessment that is specific to the trainees' specialty context, by using assessment tools, for example, that are known by the supervisors from both contexts<sup>3,51,60</sup> or by developing assessment tools for intraprofessional learning.</p>
<b>Learning climate</b>	<p>Make supervisors take responsibility for creating a supportive, collaborative learning climate with regular discussions about what OSP trainees do or do not learn from supervision<sup>67</sup>.</p> <p>Make all supervisors take responsibility for an attitude of the inclusiveness of OSP trainees.</p>
<b>Organizational aspects</b>	<p>Provide appropriate resources for OSP trainees.</p> <p>Pay attention to learning outcomes that address the OSP trainees' needs in relation to their own specialty<sup>4,10,38,55</sup> and provide exposure to experiences that are relevant to the OSP trainees.</p>
<b>Connection between professional contexts</b>	<p>Make a clear and visible connection between the specialty context of the trainee and that of the OSP .</p> <p>Connect the professional contexts during OSPs by creating opportunities for supervisors from both contexts to collaborate in giving feedback and organizing joint training events<sup>11</sup>, or by organizing integrative placements in which trainees partially work in their own context<sup>38,50,55</sup>.</p> <p>Explicitly address the learning of intraprofessional collaboration during OSPs as OSP trainees will be working with their future colleagues.</p>

**Table 3.** Factors to consider when designing and maximizing learning in OSPs

The above-mentioned recommendations were made by either trainees or supervisors in the articles reviewed in this scoping review. In order to determine whether these factors will actually improve learning during OSPs, further research is needed, including assessment of

trainees on competencies gained. We conclude that many studies about (evaluating) OSPs did not apply an educational theoretical framework. Some studies applied workplace-learning theory, but none of the reviewed studies applied theory about boundary crossing, although OSPs are one of the scarce moments when visiting trainees cross the boundary of their own specialty into another specialty. It would be a pity if opportunities to learn intraprofessional collaboration by boundary crossing would remain unused. We identified the use of boundary crossing theory as a gap in the existing literature regarding learning during OSPs. In our experience, boundary crossing theory could fit very well to underpin the design of OSPs. When evaluating these OSPs, boundary crossing could be used as a theoretical framework or lens.

## **Conclusions**

For OSPs to be effective, simply 'sitting in' and 'working along' are not good enough. This scoping review could be a springboard to improve the outcomes of OSPs. The design of OSPs ideally is a deliberate process in which a clear and visible connection between the trainees' specialty context and that of the OSP is embedded in trainee teaching, supervision and assessment. Intraprofessional collaboration could be addressed more explicitly as a learning goal. For trainees to fully profit from OSPs, important elements are the following: trainees and supervisors should clearly understand both the trainees' specialty context and OSP's context; intentional planning of placement schedules should provide exposure to experiences relevant for OSP trainees; supervision and feedback should be tailored to the OSP trainees' educational needs; and there should be a focus on intraprofessional collaboration as a learning outcome.

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## **Data Availability Statement**

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request

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## APPENDIX 1. SEARCH STRINGS

PubMed (19-08-2020)

Search string	2020
((((hospital post[tiab] OR hospital posts[tiab] OR hospital training[tiab] OR integrated training post[tiab] OR integrated training posts[tiab] OR hospital vocational training[tiab] OR off service[tiab] OR (placement[tiab] AND learning[tiab]) OR training placement[tiab] OR hospital rotation[tiab]))) AND ((trainee[tiab] OR trainees[tiab] OR vocational training[tiab])) AND ((General practi*[tiab] OR family medicine[tiab] OR primary healthcare[tiab] OR primary health care[tiab] OR GP[tiab] OR learning[tiab]))) OR ((off-service[tiab] AND resident*[tiab] AND (learning[tiab] OR rotat*[tiab])))	232
(Trainee*[ti] OR fellow[tiab] OR fellows[tiab] OR intern[ti] OR interns[ti] OR house officer [tiab] OR specialist registrar*[tiab] OR specialty registrar*[tiab] OR foundation doctor*[tiab] OR (integrated[tiab] AND training[ti]) AND ("Interdisciplinary placement" [Mesh] OR training post[ti] OR rotat*[ti] OR placement*[ti] OR clinorotation*[tiab] OR workplace based assessment*[ti] OR hospital post*[ti]) AND ("Learning"[Mesh] OR "Education, Medical, Continuing"[Mesh] OR "Education, Medical, Graduate"[Mesh] OR education[subheading] OR learn* [tiab] OR (educat*[tiab] AND medical[tiab]) OR qualitative[tiab])	159
((Trainee*[tiab] OR resident*[tiab] OR fellow[tiab] OR fellows[tiab] OR intern[tiab] OR interns[tiab] OR house officer [tiab] OR specialist registrar*[tiab] OR specialty registrar*[tiab] OR foundation doctor*[tiab]) AND ("Internship and residency"[Mesh] OR "Interdisciplinary placement" [Mesh] OR Residenc* [tiab] OR internship* [tiab] OR traineeship [tiab] OR (hospital[tiab] AND vocational training [tiab]) OR hospital training [tiab] OR training post [tiab] OR training program* [tiab] OR rotation* [tiab] OR placement* [tiab] OR fellowship* [tiab] OR clinorotation* [tiab] OR workplace based assessment[tiab] OR hospital post*[tiab]) AND ("Learning"[Mesh] OR "Education, Medical, Continuing"[Mesh] OR "Education, Medical, Graduate"[Mesh] OR learn* [tiab] OR (educat*[tiab] AND medical[tiab])) AND ("Intersectoral Collaboration"[Mesh] OR interprofession* [tiab] or intraprofession* [tiab] OR cross-disciplin*[tiab] OR interdisciplin*[tiab]))	624
(Trainee*[tiab] OR resident*[tiab] OR fellow[tiab] OR fellows[tiab] OR intern[tiab] OR interns[tiab] OR house officer [tiab] OR specialist registrar*[tiab] OR specialty registrar*[tiab] OR foundation doctor*[tiab]) AND ("Internship and residency"[Mesh] OR "Interdisciplinary placement" [Mesh] OR Residenc* [tiab] OR internship* [tiab] OR traineeship [tiab] OR (hospital[tiab] AND vocational training [tiab]) OR hospital training [tiab] OR training post [tiab] OR training program* [tiab] OR rotation* [tiab] OR placement* [tiab] OR fellowship* [tiab] OR clinorotation* [tiab] OR workplace based assessment[tiab] OR hospital post*[tiab]) AND ("Learning"[Mesh] OR "Education, Medical, Continuing"[Mesh] OR "Education, Medical, Graduate"[Mesh] OR learn* [tiab] OR (educat*[tiab] AND medical[tiab])) AND (educational principles [tiab] OR educational concepts [tiab] OR cognitive apprenticeship* [tiab] OR "Social identification"[MeSH])	54
boundary cross*	170
off-service	101
(clinical rotation*[tiab] OR rotating residen*[tiab]) AND didactic*[tiab] NOT undergraduate*[tiab]	103

## PsycINFO 19-08-2020

#	Search string	Results
1	learning/ or adult learning/ or collaborative learning/ or cooperative learning/ or exp experiential learning/ or exp incidental learning/ or intentional learning/ or observational learning/ or self-regulated learning/ or exp skill learning/ or exp social learning/ or exp "transfer (learning)"/ or exp verbal learning/	111897
2	(learn* and (medical or clinical)).ti,ab,id.	40753
3	(educat* and medical).ti,ab,id.	36997
4	1 or 2 or 3	177115
5	(Trainee* or fellow or fellows or intern or interns or house officer or specialist registrar* or specialty registrar* or foundation doctor* or (integrated and training)).ti,ab,id.	32615
6	4 and 5	5574
7	medical internship/	506
8	exp medical education/	24135
9	exp medical education/ or Residenc*.ti,ab,id. or internship*.ti,ab,id. or traineeship.ti,ab,id. or (hospital and vocational training).ti,ab,id. or hospital training.ti,ab,id. or training post.ti,ab,id. or training program*.ti,ab,id. or rotation*.ti,ab,id. or placement*.ti,ab,id. or fellowship*.ti,ab,id. or clinorotation*.ti,ab,id. or workplace based assessment.ti,ab,id. or hospital post*.ti,ab,id.	117795
10	6 and 9	3230
11	medical.ti,ab,id.	200828
12	5 and 11	4842
13	4 and 9 and 12	2109
14	medical internship/ or medical residency/ or psychiatric training/	8044
15	(Residenc* or internship* or traineeship or (hospital and vocational training) or hospital training or training post or rotation* or placement* or fellowship* or clinorotation* or workplace based assessment or hospital post*).ti,ab,id.	73082
16	14 or 15	77478
17	4 and 12 and 16	1160
18	(interprofession* or intraprofession* or cross-disciplin* or interdisciplin*).ti,ab,id.	29331
19	17 and 18	53

## PsycINFO (19-08-2020)

#	Search string	Results
1	learning/ or adult learning/ or collaborative learning/ or cooperative learning/ or exp experiential learning/ or exp incidental learning/ or intentional learning/ or observational learning/ or self-regulated learning/ or exp skill learning/ or exp social learning/ or exp "transfer (learning)"/ or exp verbal learning/	111897
2	(learn* and (medical or clinical)).ti,ab,id.	40753
3	(educat* and medical).ti,ab,id.	36997
4	1 or 2 or 3	177115
5	(Trainee* or fellow or fellows or intern or interns or house officer or specialist registrar* or specialty registrar* or foundation doctor* or (integrated and training)).ti,ab,id.	32615
6	exp medical education/ or Residenc*.ti,ab,id. or internship*.ti,ab,id. or traineeship.ti,ab,id. or (hospital and vocational training).ti,ab,id. or hospital training.ti,ab,id. or training post.ti,ab,id. or training program*.ti,ab,id. or rotation*.ti,ab,id. or placement*.ti,ab,id. or fellowship*.ti,ab,id. or clinorotation*.ti,ab,id. or workplace based assessment.ti,ab,id. or hospital post*.ti,ab,id.	117795
7	medical.ti,ab,id.	200828
8	5 and 7	4842
9	4 and 6 and 8	2109
10	medical internship/ or medical residency/	4938
11	(Residenc* or internship* or traineeship* or (hospital and vocational training) or hospital training or training post or rotation* or placement* or fellowship* or clinorotation* or workplace based assessment or hospital post*).ti,ab,id.	73082
12	10 or 11	74339
13	4 and 8 and 12	2109
14	(interprofession* or intraprofession* or cross-disciplin* or interdisciplin*).ti,ab,id.	29331
15	13 and 14	111
16	(Residenc* or internship* or traineeship* or (hospital and vocational training) or hospital training or training post or training program* or rotation* or placement* or fellowship* or clinorotation* or workplace based assessment or hospital post*).ti.	17373
17	13 and 16	265
18	17 not 15	250

## ERIC (19-08-2020)

#	Search string	Results
1	(learn* and (medical or clinical)).ti,ab,tw.	11560
2	(educat* and medical).ti,ab,tw.	23805
3	(Trainee* or fellow or fellows or intern or interns or house officer or specialist registrar* or specialty registrar* or foundation doctor* or (integrated and training)).ti,ab,tw.	19444
4	clinical experience/ or on the job training/ or graduate medical education/	6824
5	exp medical education/ or Residenc*.ti,ab,tw. or internship*.ti,ab,tw. or traineeship.ti,ab,tw. or (hospital and vocational training).ti,ab,tw. or hospital training.ti,ab,tw. or training post.ti,ab,tw. or training program*.ti,ab,tw. or rotation*.ti,ab,tw. or placement*.ti,ab,tw. or fellowship*.ti,ab,tw. or clinorotation*.ti,ab,tw. or workplace based assessment.ti,ab,tw. or hospital post*.ti,ab,tw.	86907
6	(medical or clinic*).ti,ab,tw.	63634
7	(Residenc* or internship* or traineeship* or (hospital and vocational training) or hospital training or training post or training program* or rotation* or placement* or fellowship* or clinorotation* or workplace based assessment or hospital post*).ti.	11664
8	learning/ or active learning/ or adult learning/ or cooperative learning/ or experiential learning/ or incidental learning/ or intentional learning/ or lifelong learning/ or observational learning/ or problem based learning/ or sequential learning/ or student centered learning/ or "transfer of training"/ or verbal learning/ or workplace learning/	76651
9	1 or 2 or 8	104002
10	3 and 9	2631
11	4 or 5	89972
12	10 and 11	1146
13	6 and 12	704
14	7 and 13	96



**Web of Science (19-08-2020)**

#	Search string	Results
1	TS=(trainee* OR GP OR "general practi*" OR resident* OR fellow OR fellows OR intern OR interns OR "specialist registrar*" OR "specialty registrar*") <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>413795</b>
2	TS=(internship* OR residenc* OR placement* OR traineeship* OR "vocational training" OR "hospital training" OR "training post" OR "training program*" OR rotation* OR fellowship* OR clinorotation* OR "workplace based assessment" OR "hospital post") <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>764314</b>
3	TS=(medical OR clinic*) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>4296205</b>
4	TS=(learning OR education*) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>1472387</b>
5	#4 AND #3 AND #2 AND #1 <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>10631</b>
6	TI=(Residenc* OR internship* OR traineeship* OR "vocational training" OR "hospital training" OR "training post" OR "training program*" OR rotation* OR placement* OR fellowship* OR clinorotation* OR "workplace based assessment" OR "hospital post*") <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>170328</b>
7	#6 AND #5 <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>2818</b>
8	TS=(intradisciplin* OR intraprofessional OR interprofessional OR cross-disciplin*) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>13734</b>
9	#8 AND #7 <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>47</b>
10	TS=(hospital OR (general AND practic*) OR (medical AND clinic) OR (hospital AND post)) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>1026318</b>
11	#10 AND #7 <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>795</b>
12	TS=(undergraduate) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>73232</b>
13	#11 NOT #12 <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>748</b>
14	(#13) AND <b>DOCUMENT TYPES:</b> (Article) <i>Indexes=SCI-EXPANDED, SSCI, A&amp;HCI, ESCI Timespan=All years</i>	<b>708</b>

## APPENDIX 2. INCLUDED ARTICLES

Article	Research aim/ question(s)	Method	Population	Theoretical and/or educational framework	Quality score	Reference #
1 Al-Khathami (2012) Saudi Arabia	<p>Aim: effective evaluation strategy that helps achieve program objectives and enhances the quality of learning objectives</p> <p>Questions: (1) seek trainees' perceptions about the SDFM program; (2) identify the strengths and weaknesses of the SDFM program in relation to the learning outcomes; and (3) define the main obstacles to achieve the outcomes</p>	Mixed-methods by surveys with Likert-scales and open ended questions	31 FM trainees in different HPs (IM, paediatrics, ENT, obs-gyn, ophthalmology, dermatology, psychiatry, general surgery, orthopaedics), Saudi Arabia	Not specifically mentioned	Poor	37
2 Al-Rowais (2000) Saudi Arabia	<p>Aim: to assess perception and satisfaction of primary health care (PHC) trainees regarding their hospital training in Internal Medicine and Pediatrics.</p> <p>Factors affecting training were also evaluated.</p> <p>Questions: not explicitly formulated.</p>	Cross-sectional by questionnaire	51 FM trainees in IM and paediatrics, Saudi Arabia	- Not specifically mentioned	Moderate	14
3 Alquaiz (2013) Saudi Arabia	<p>Aim: To explore Family Medicine Trainees views regarding the hospital component of their Family Medicine (FM) training program</p> <p>Questions: The first section was evaluation of the satisfaction of trainees with the different hospital specialities rotations. Satisfaction was measured on a scale of 1-5. Excellent one and unsatisfactory five.</p> <p>The second section related to reasons for rating the different rotations as excellent and very good. The third section related to deficiencies in training for those rotations which received a score of 3-5.</p>	Qualitative by focus group discussion (2 hours)	13 FM trainees in different HPs (IM, orthopaedics, paediatrics, obs-gyn, surgery, EM, community medicine, psychiatry, dermatology, ophthalmology, ENT) and 10 trainers, Saudi Arabia	Not specifically mentioned	Good	38

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
4 Alquraini (2013) Saudi Arabia	Aim: to assess medical residents' perceptions, opinions, and levels of satisfaction with their "off-service" rotations at a major residency training site in Saudi Arabia. It was also to evaluate the reliability and validity of a questionnaire used for quality assurance in these rotations. Questions: not explicitly formulated.	Cross-sectional by close-ended questions	80 different off-service residents (EM, IM, FM, neurology, paediatrics, obstetrics, surgery), Saudi Arabia	Feedback theory	Poor	10
5 Annamalai (2014) USA	Aim: to survey general psychiatry programs on the extent of general medicine training provided during residency. Questions: not explicitly formulated.	Cross-sectional by close-ended questions	12 residency directors on FM placement for psychiatry residents, USA	Not specifically mentioned	Poor	39
6 Arulanandam (2015) UK	Aim: to obtain feedback on 'The Training Across Boundaries Project' from all of the participants Questions: not explicitly formulated.	Qualitative by structured interviews	12 Psychiatry residents in medical specialty (neurology, EM, paediatrics, GI, diabetes and endocrinology) or primary care setting, UK	Interdisciplinary working and learning	Good	1
7 Ben Hammoud (2011) Swiss	Aim: to obtain the opinion and feeling of young doctors that worked in an interdisciplinary model Questions: not explicitly formulated	Evaluation (quantitative, 5-point scale) to have the opinions and feelings of young doctors that worked in an interdisciplinary model in EM department	78 residents (31 Surgery & 46 internal residents) in interdisciplinary model in EM department, Suisse	Interdisciplinary working and learning	Good	36
8 Beveridge (2014) UK	Aim: to evaluate the effect of participation in the scheme on trainees' confidence in acute paediatrics was assessed. Questions: not explicitly formulated	Intervention study by survey: Qualitative through feedback, method used unknown and quantitative by questionnaire	9 GP trainees in paediatric assessment placement, UK	Not specifically mentioned	Moderate	40

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
9 Branzetti (2010) USA	Aim: The primary objective of this work was to quantify characteristics of rotating residents and the didactic curricula offered to them during their EM rotations. Secondary objectives were to identify barriers to instituting such didactics and to establish ideal curricular contents. Questions: not explicitly formulated	Cross-sectional by close-ended survey	100 residency leaders of EM residency programs having rotating residents, USA	Not specifically mentioned	Poor	3
10 Burman (2019) Germany	Aim: This pilot study aimed to evaluate feasibility of assessing palliative care knowledge (PCK) and palliative care self-efficacy (PCSE) using a paper-based questionnaire. Questions: not explicitly formulated	Quantitative by: Primarily, evaluation (Likert scale) of the feasibility of using a questionnaire to analyse palliative care knowledge (PCK) and palliative care self-efficacy expectation following an SPC rotation. Secondly, evaluation of the difference in PCK, self-efficacy expectations, and knowledge regarding local hospice and palliative teams between residents and board-certified specialists.	17 resident physicians and fellows from different specialties (predominantly oncology and anaesthesiology) in a 6- to 12-month rotation in (three) specialized palliative care units (joint care network), Germany	(learning) Integrated (palliative) care	Good	41

Article	Research aim/ question(s)	Method	Population	Theoretical and/or educational framework	Quality score	Reference #
11 Carter (2003) UK/Canada	Aim: to determine whether the expectations of off-service residents rotating through an emergency department (ED) rotation were being met. Questions: the degree to which offservice residents attained their educational expectations during their emergency medicine (EM) rotation, and thereby whether it is likely that a learner-centered approach would enrich the experience.	Pre-rotation expectations & Post-rotation outcome. 144 survey items, (Likert scale) in 3 sections: Presenting Complaints; Skills/Procedures; Diagnosis	10 Fam medicine, 7 medical specialties, 8 surgical specialties, Canada	Learner-centered approach	Moderate	42
12 Chakravarthy (2015) USA	Aim: quantify the difference between off-service residents rotating in the ED and their EM resident counterparts. Also sought to find whether shift cards could be used to increase the productivity of off-service residents rotating in the ED. Questions: not explicitly formulated	Prospective cohort study	29 Off-service residents (FM, anaesthesiology, obstetrics and gynaecology, otolaryngology and psychiatry) in EM before intervention, compared to 33 after intervention and 12 EM residents before intervention, California, USA	Learning by exposure	Poor-Moderate	43
13 Chen (2007) USA	Aim: to evaluate the response of the IM residents in a university-based training program to a Hem/Onc rotation in order to assess the quality of the rotation and identify areas that need improvement. Questions: not explicitly formulated	Cross-sectional by questionnaire	64 IM residents in haematology/oncology rotation, New York, USA	learning by exposure	Moderate	44

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
14 Denney (2014) UK	Aim: to provide support to the hospital supervisors in order to improve the overall quality of hospital posts in GPST programmes and their relevance to General Practice training, and to provide guidance to GP trainees to target their learning most effectively within each speciality post to improve relevance to future career. Questions: not explicitly formulated	Cross-sectional by survey	119 GP trainees in different HPs, UK	Competency based learning	Poor	45
15 Duke (2011) Canada	Aim: Evaluation of an ambulatory versus an inpatient pediatrics rotation for family medicine residents. Patient logbook entries, as well as residents' satisfaction, knowledge, and self-reported confidence outcomes were compared between family medicine residents completing the new ambulatory rotation and those completing a traditional inpatient ambulatory pediatrics rotation Questions: not explicitly formulated	Prospective cohort study	79 Family Medicine in paediatric outpatient clinics, Canada	Intraprofessional collaboration and learning by exposure	Moderate	46
16 Eiser (2008) USA	Aim: Before and after the Systems-Based Practice Experience, we perform pre- and posttest assessments of the residents' knowledge of the disciplines. We also ask them, after the project, about their subjective impressions regarding the benefit of the experience. Questions: not explicitly formulated	Mixed-methods by knowledge test and evaluation of programme	23 IM residents in home care, hospice care, pharmacy services, laboratory services, utilization services, Pennsylvania, USA	Interdisciplinary collaboration and education	Poor	47

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
17 Faulk (2012) USA	Aim: to test the geriatric knowledge of the residents prerotation and postrotation and in comparison with other faculty and residents; to evaluate the attitude of trainees toward the geriatric population; and to evaluate trainee attitude on teamwork. Questions: not explicitly formulated	Intervention study by questionnaire	10 Physical Medicine & Rehabilitation trainees in geriatrics, North Carolina, USA	Interdisciplinary teamwork	Moderate	48
18 Forsyth (2020) USA	Aim: to assess clinical genetics knowledge and to evaluate the rotation. Questions: not explicitly formulated	Cohort/ Mixed-methods by knowledge pre-test and post-test, logbooks and evaluation of rotation with Likert-scales and open spaces for comments and feedback for rotation improvement	50 First-year Paediatrics residents immersed in clinical genetics by attending outpatient clinics and seeing inpatient consults, Baltimore, USA.	Learning by exposure	Good	49
19 Griffin (2011) UK	Aim: to evaluate innovative/ integrated training posts (ITPs) Questions: not explicitly formulated	Mixed-methods by surveys with Likert-scales and open ended questions	29 GP trainees in hospital placements (ITP), 61 GP trainers and 17 ITP trainers, Kent, Surrey and Sussex, UK	Integrated care and training/ education	Good	50
20 Harrison (2016) USA	Aim: to evaluate the effectiveness of a one-week community HPM rotation for military medical residents. Questions: not explicitly formulated	Mixed-methods by tests on competencies, essays and semi-structured interviews	45 Military medical residents in hospice medicine and 11 interdisciplinary hospice preceptors for interviews, Washington DC, USA	Interactive and experiential teaching methods	Good	51
21 Looman (2020) the Netherlands	Aim: to gain insight into the potential of hospital placements for learning intraprofessional collaboration (intraPC). Questions: (a) When and how do PC residents and MS residents learn intraPC during hospital placements?, and (b) What are opportunities for and barriers to learning intraPC during these placements?	Qualitative: ethnographic non-participatory observational study and in-depth interviews (14 primary care residents, 14 medical specialist residents, 14 medical specialist supervisors)	11 GP residents and 3 elderly care residents at Emergency department or Geriatric department and Medical specialist residents from different specialties and medical specialist supervisors, the Netherlands	Intraprofessional collaboration and education, workplace based learning	Good	52

Article	Research aim/ question(s)	Method	Population	Theoretical and/or educational framework	Quality score	Reference #
22 Makris (2010) UK	Aim: to explore the views and experiences of a sample of hospital consultants using the RCGP e-portfolio, within the wider context of WPBA Questions: not explicitly formulated	Qualitative by semi-structured interviews (25-40 min)	7 hospital consultants who supervise GP trainees in hospital placements, location unknown (most likely UK)	Learning by portfolio and workplace-based assessment	Good	53
23 Melville (2002) UK	Questions: How long should paediatric training be for GPs? What are their training priorities within this time?	Mixed-method: Quantitative 5-point Likert scale and qualitative by free text comments	230 GPs about their paediatric training as GP trainee, UK	Learning by exposure/experiential learning	Moderate	54
24 Michelson (2019) USA	Aim/questions: To better understand residents' experiences in the block, including their attitudes about the block; how the block affected professional relationships including those with preceptors, peers, and patients; and whether the block influenced learning or practice.	Qualitative by interviews and focus group discussion to explore residents' attitudes about the block; how the block affected their relationships; and the block's impact on learning and practice.	14 paediatric residents undertaking a 3-month longitudinal integrated training block for residents, combining 3 previously discrete, shorter rotations in developmental-behavioural paediatrics, advocacy, and emergency medicine into a longer and integrated experience, Massachusetts, USA	Educational theories of generative learning and interprofessional learning	Good	7
25 Munk (2010) Denmark	Aim: To explore the educational impact of going back to general practice for one day per month during hospital training.	Qualitative by focus group interviews	16 GP in HPs and 3 trainers, Denmark	Self-directed learning	Poor	55
26 Nguyen (2016) USA	Not specifically mentioned.	Mixed-method: Quantitative 5-point Likert scale and qualitative by comments in online evaluation	193 Paediatrics (general and child neurology) in a genetic placement, Houston, USA	Learning by exposure.	Moderate	56



Article	Research aim/ question(s)	Method	Population	Theoretical and/or educational framework	Quality score	Reference #
27 Nixon (2018) Canada	Aim: To compare perceptions of oncology as a specialty, comfort in managing cancer patients, and level of basic oncology knowledge before and after the rotation. Secondary objective: compare the characteristics of oncology rotations at 4 participating teaching cancer centers.	Intervention study by survey	48 Internal Medicine in oncology, Canada	Learning by exposure. Self-directed learning	Good	57
28 O'Connor (2018) Ireland	To determine the clinical learning experiences of GP's who rotated through an academic urban minor injuries unit as part of their training, led by advanced nurse practitioners (emergency).	Qualitative by semi-structured interviews (65-90 min)	5 GPs in academic minor injuries/illnesses, Ireland	IPE, role modelling	Good	58
29 Onate (2008) USA	Not specifically mentioned, but the focus seems to be on: determine the number of patients seen by the service and the number of psychiatric consults, To review evaluations by psychiatry residents completing the rotation.	Mixed-methods (method unknown)	(number unknown) Psychiatry residents in IM, California, USA	Not specifically mentioned	Poor	59
30 Rickenbach (2006) UK	Aim: to evaluate the first six-month cohort of 18 innovative training program posts as alternative to the traditional hospital-based model of training (for GPs). Questions: not explicitly formulated	Mixed-methods by questionnaire, written feedback and focus groups	18 Trust-attached GP registrar (TAG) posts, compared to 242 Senior House Officer posts (GP in different Hospital Posts (elderly medicine, psychiatry, palliative care, dermatology, obs-gyn, A&E, rheumatology, ENT), UK	Not specifically mentioned	Good	11

Article	Research aim/ question(s)	Method	Population	Theoretical and/or educational framework	Quality score	Reference #
31 Sabey (2011) UK	Aim: to establish how the new system of WPBA is working in day-to-day practice for a cohort of GP trainees in hospital posts, seeking their views of the process and experience of assessments, their perceptions of assessors' understanding and skills, and their suggestions for improvement. Questions: not explicitly formulated	Mixed-methods by questionnaire and focus groups	78 GP trainees in hospital posts, 20 in focus groups, UK	Workplace-based assessment	Good	60
32 Sabey (2012) UK	Aim: to explore the views of hospital-based assessors across a range of specialities about how WPBA works with GP trainees. Questions: not explicitly formulated	Qualitative by semi-structured interviews (20-35 min)	GP trainees in different hospital posts, interviews by 15 consultants (EM, obs-gyn, elderly medicine, neurology, orthopedics, otorhinolaryngology, pediatrics, palliative care, psychiatry, renal medicine), UK	Workplace-based assessment	Good	15
33 Shofler (2019) USA	Aim: to investigate the off-service rotation experience. By portraying the perspectives of both directors and residents, the goal is to help program directors improve these rotations for their residents. Questions: The survey question topics included rotation value, length, goals and objectives, activities, feedback, and resident satisfaction	Cross-sectional	Residents in Podiatric and surgery 151 residents & 122 program directors, USA	Not specifically mentioned	Moderate	4

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
34 Sieglar (2014) USA	Aim: to describe the rotation and the initial evaluation of its effectiveness Questions: (1) Residents were asked to rate interest in geriatrics before and after participating in the systems-based practice module rotation (SBP-OM), (2) Residents also were asked if they had applied what they had learned about systems of care clinically outside the geriatrics rotation, (3) The third set of questions asked if the SBP-OM had a lasting impact.	Mixed-methods by survey with 5-point Likert scale and qualitative feedback via open-ended comments	47 IM residents in Geriatrics, New York, USA	learning by exposure and self-directed learning	Poor	61
35 Thomas (2003) USA	Aim: to identify education interventions and curriculum recommendations for training internal medicine residents in geriatrics. This paper describes 1) "best practices" for integrating geriatrics education into internal medicine residency programs, 2) barriers to implementation of these practices, and 3) possible ways to improve geriatrics training for internal medicine residents.	Systematic review and interviews (60 min)	Internal medicine residents in geriatrics, plus 26 interviews with leaders of geriatric training and programmes, USA	Not specifically mentioned	Moderate	62
36 Thomas (2018) UK	Aim: To explore the experiences of the '1-hour protected supervision model' for GP trainees in psychiatry placements in the UK. Question: 'What are GP trainees' experiences about the 1-h protected supervision given during a placement in psychiatry as part of a UK GP training scheme?'	Mixed-methods by questionnaire	31 GPs in psychiatry, UK	Learning by supervision	Good	63

Article	Research aim/ question(s)	Method	Population	Theoretical and/ or educational framework	Quality score	Reference #
37 Vergo (2017) USA	Aim: To assess the acquisition of primary palliative care communication skills as well as acceptability in IM residents who were required to rotate on a palliative care inpatient service.	Single arm cohort study, with mixed-methods evaluation of rotation by survey: 5-point Likert scales and comments sections	12 IM residents in palliative care, Dartmouth, USA	Learning communication skills through structured communication training	Moderate	64
38 Von Gunten (2003) USA	Aim: to evaluate residents experience before and after the rotation and to evaluate the rotation	Intervention study by survey	40 IM and FM residents in hospice rotation, San Diego, USA	Interdisciplinary team collaboration and learning by watching	Poor	65
39 Waterbrook (2016) USA	Aim: to evaluate both the sports medicine and orthopedic rotations, including faculty and chief resident assessment of resident performance, post rotation surveys by residents, and procedure log tracking. Questions: not explicitly formulated	Multiple methods: by evaluation based upon the six core competencies, recording procedures they performed in a procedure log and post-rotation feedback (Likert scale and free text comments).	EM residents in a 4-week sports medicine rotation in a primary care sports medicine institute or/ and orthopedic clinics, Tucson, USA	The American Academy of Family Physicians published core sports educational guidelines	Good	8
40 Yaman (2002) Turkey	Aim: To explore how satisfied family medicine residents are with their training in teaching hospitals and current postgraduate training program Questions: not explicitly formulated	Cross-sectional by open- and closed-ended questions	101 FM in different hospital placements (IM, obs-gyn, pediatrics, surgery, psychiatry), Turkey	Not specifically mentioned	Poor	66

**Abbreviations:** FM: family medicine, HP: hospital placement, IM: internal medicine, ENT: ear nose throat, obs-gyn: obstetrics gynaecology, EM: emergency medicine, GI: gastro-intestinal, GP: general practitioner, ITP: integrative training placements

## APPENDIX 3A. JBI CRITICAL APPRAISAL CHECKLIST FOR QUALITATIVE RESEARCH <sup>32</sup>

#	Question	Yes	No	Unclear	Not applicable
1	Is there congruity between the stated philosophical perspective and the research methodology?	7,42,51-53,55-58,60,63		1,15,50,54,56,59	38,40
2	Is there congruity between the research methodology and the research question or objectives?	1,7,15,38,40,42,50-55,58,60,63		56,59	
3	Is there congruity between the research methodology and the methods used to collect data?	1,7,15,38,40,42,50-54,56,58,63	55,60	59	
4	Is there congruity between the research methodology and the representation and analysis of data?	1,7,15,38,40,42,50-53,58,60,63	54-56	59	
5	Is there congruity between the research methodology and the interpretation of results?	1,7,15,38,42,50-53,58,60,63		40,54-56,59	
6	Is there a statement locating the researcher culturally or theoretically?	7,50,54,60,63	1,15,38,40,42,51-53,55,56,58,59		
7	Is the influence of the researcher on the research, and vice-versa, addressed?	52,58	1,7,15,38,40,42,50,51,53-56,59,60,63		
8	Are participants, and their voices, adequately represented?	1,7,15,38,50-53,58,60,63		8,42,54-56,59	40
9	Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	7,38,42,50-53,55,56,58,60,63	54,59	1,15,40	
10	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	1,7,15,38,42,50-55,58,60,63		40,56,59	

## APPENDIX 3B. JBI CRITICAL APPRAISAL CHECKLIST FOR CROSS-SECTIONAL RESEARCH <sup>32</sup>

#	Question	Yes	No	Unclear	Not applicable
1	Were the criteria for inclusion in the sample clearly defined?	11,14,36,37,41,44,47,66	3,4,10,39,45,61		
2	Were the study subjects and the setting described in detail?	4,10,11,14,36,41,44,45,66	3,39,47	37,61	
3	Was the exposure measured in a valid and reliable way?	4 <sup>1</sup>			3,4,10,11,14,36,37,39,44,45,47,61,66
4	Were objective, standard criteria used for measurement of the condition?	4 <sup>1</sup>			3,4,10,11,14,36,37,39,44,45,47,61,66
5	Were confounding factors identified?	4,11,39,41,44	3,10,14,36,37,45,47,61,66		
6	Were strategies to deal with confounding factors stated?	4 <sup>4</sup>	3,4,10,11,14,36,37,39,41,45,47,61,66		
7	Were the outcomes measured in a valid and reliable way?	3,10,11,14,36,37,39,41,61		4,44,45,47,66	
8	Was appropriate statistical analysis used?	4,10,11,14,41,44		3,36,37,39,45,47,61,66	

## APPENDIX 3C. JBI CRITICAL APPRAISAL CHECKLIST FOR COHORT STUDIES <sup>32</sup>

#	Question	Yes	No	Unclear	Not applicable
1	Were the two groups similar and recruited from the same population?	8,43,49	48	46	57,64,65
2	Were the exposures measured similarly to assign people to both exposed and unexposed groups?	8			43,46,48,49,57,64,65
3	Was the exposure measured in a valid and reliable way?	8,49	43		46,48,57,64,65
4	Were confounding factors identified?	43,48,57	8,46,49,64,65		
5	Were strategies to deal with confounding factors stated?	57	8,43,46,48,49,64,65		
6	Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?	46,49,65		8,48,57,64	43
7	Were the outcomes measured in a valid and reliable way?	8,46,48,49,57,64		43,65	
8	Was the follow up time reported and sufficient to be long enough for outcomes to occur?	43,57,64 8,46,48,49,65			
9	Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	43,49,64	46,57	8,48,65	
10	Were strategies to address incomplete follow up utilized?		8,46,48,57,64	43,49,65	
11	Was appropriate statistical analysis used?	8,46,48,49,57,64		43,65	

## APPENDIX 3D. JBI CRITICAL APPRAISAL CHECKLIST FOR SYSTEMATIC REVIEWS AND RESEARCH SYNTHESSES <sup>32</sup>

#	Question	Yes	No	Unclear	Not applicable
1	Is the review question clearly and explicitly stated?	62			
2	Were the inclusion criteria appropriate for the review question?			62	
3	Was the search strategy appropriate?	62			
4	Were the sources and resources used to search for studies adequate?	62			
5	Were the criteria for appraising studies appropriate?		62		
6	Was critical appraisal conducted by two or more reviewers independently?		62		
7	Were there methods to minimize errors in data extraction?		62		
8	Were the methods used to combine studies appropriate?			62	
9	Was the likelihood of publication bias assessed?		62		
10	Were recommendations for policy and/or practice supported by the reported data?	62			
11	Were the specific directives for new research appropriate?		62		



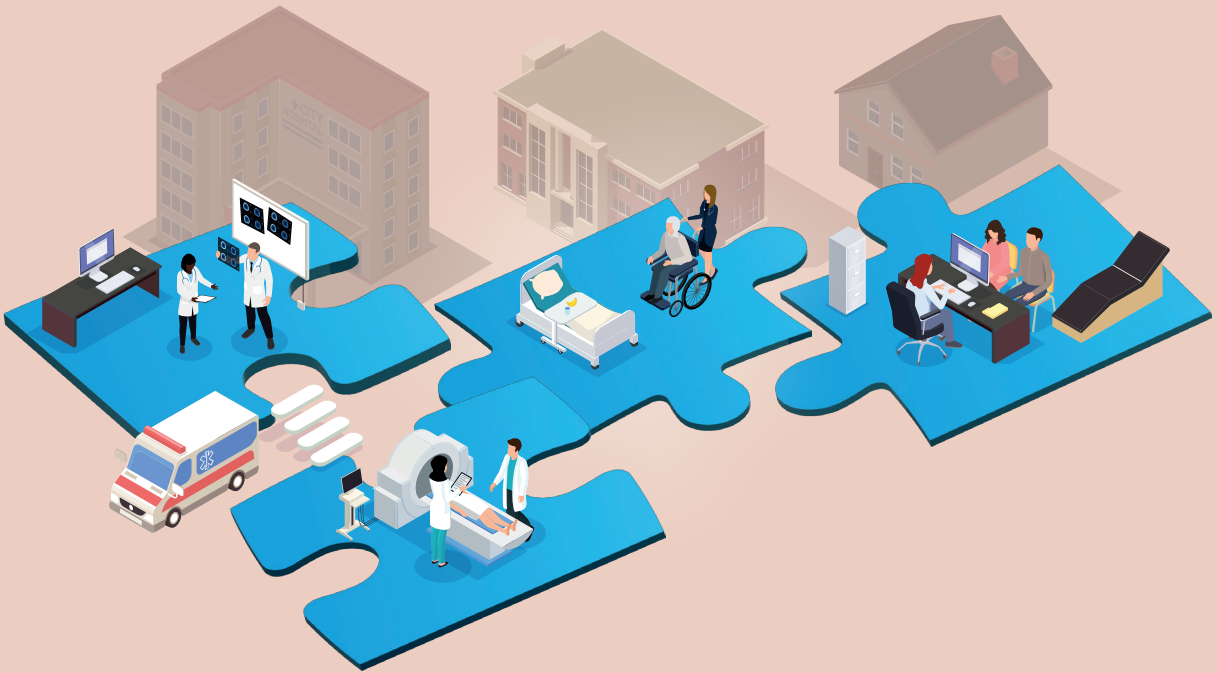




*“When ‘i’ is  
replaced by ‘We’,  
even Illness  
becomes Wellness”*

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**Malcolm X**



# CHAPTER 3

## Chances for learning intraprofessional collaboration between residents in hospitals

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# **ABSTRACT**

## **Context**

Intraprofessional collaboration (intraPC) between primary care (PC) doctors and medical specialists (MS) is becoming increasingly important. Patient safety issues are often related to intraPC. In order to equip doctors well for their task to provide good quality and continuity of care, intraPC needs explicit attention starting in postgraduate training. Worldwide, PC-residents undertake a hospital placement during their postgraduate training where they work in proximity with MS-residents. This placement offers the opportunity to learn intraPC. It is yet unknown whether and how residents learn intraPC and what barriers and opportunities exist for learning intraPC during hospital placements.

## **Methods**

We performed an ethnographic non-participatory observational study in three emergency departments and three geriatric departments of five hospitals in the Netherlands. This was followed by 42 in-depth interviews with the observed residents and supervisors. The observations were used to feed the questions for the in-depth interviews. We analysed the interviews iteratively following the data collection using template analysis.

## **Results**

Hospital wards are rich in opportunities for learning intraPC. These opportunities, however, are seldom exploited due to various reasons: IntraPC receives limited attention when formulating placement goals, so purposeful learning of intraPC hardly takes place. Residents lack awareness for the learning of intraPC. MS-residents are not accustomed to searching for expertise from PC-residents. PC-residents adapt to the MS-role and they hardly contribute their PC-knowledge. Power dynamics in the hospital department negatively influence the learning of intraPC. Therefore an improvement in mindset, professional identity and power dynamics are crucial to facilitate and promote intraPC.

## **Conclusion**

IntraPC is not learnt spontaneously during hospital placements. To benefit from the abundant opportunities to learn intraPC, adjustments in the set-up of these placements are necessary. Learning intraPC is promoted when there is a collaborative culture; hierarchy is limited, dedicated time for intraPC and support from the supervisor.

## INTRODUCTION

Adverse events resulting from human error are reported frequently in healthcare.<sup>1,2</sup> A common contributing factor to these events is an ineffective collaboration between primary care (PC) doctors and medical specialists (MS).<sup>3,4</sup> Frequently reported issues are deficient communication and information transfer.<sup>4,5</sup> These problems could increase in many healthcare systems, because of the current tendency to translocate part of healthcare service provision from hospital to PC-settings.<sup>6</sup> This involves transitions of both patients and knowledge, leading to an increased risk of error.<sup>3,4,7</sup> Therefore, in addition to being proficient in their professional work, PC-doctors in the PC-setting and MS in the hospital should be aware of each other's context, expertise, and roles, and how to communicate and collaborate intraprofessionally.<sup>8,9</sup>

In order for doctors to be well equipped for their task to provide continuity of care between primary care and hospital setting, intraprofessional collaboration (intraPC) needs to receive special attention during postgraduate training<sup>10</sup>. This can be realised by intraprofessional education (intraPE).<sup>11</sup> However, the distance, both physical and conceptual, between PC and MS workplace and teaching environment seems to be a deeply-rooted obstacle to this strategy.<sup>8</sup> During postgraduate training, PC-residents and MS-residents do collaborate around referral to and discharge from the hospital. Their training programs, however, occur isolated from each other and focus on their own specialty.<sup>8</sup> In the Netherlands, learning during PC and MS postgraduate training is predominantly workplace-based. Both curricula and clinical commitments limit the time PC-residents and MS-residents can work together.<sup>10,11</sup> As a result, the opportunity to build on and learn from and about the strengths of each other is limited. Since the proximity of different professions in shared educational and clinical spaces and sufficient time allocation can help to build mutual rapport<sup>12</sup>, it is precisely the proximity what requires specific attention when organising intraPE.

We explored whether and how intraPE could be organized during hospital placements. In many countries, PC-residents, such as general practitioner residents and elderly care physician residents (see box 1), undertake a hospital placement during their postgraduate training.<sup>13,14</sup> This hospital ward, where PC-residents and MS-residents work in proximity, offers the opportunity to learn intraPC through intraPE. Currently, formalized intraPE is limited, therefore, if learning intraPC occurs, it will be predominantly unintentional.<sup>8</sup> To the best of our knowledge it has not been investigated whether and how PC-residents and MS-residents learn intraPC during these placements.

This study aims to gain insight into the potential of hospital placements for learning intraPC, by answering the following questions: 1. When and how do PC-residents and

MS-residents learn intraPC during hospital placements? 2. What are opportunities and barriers to learning intraPC during these placements?

<b>General Practitioner (GP)</b>	<i>Doctor “ working in the frontline of a healthcare system, taking the initial steps to provide care for any health problem(s) that patients may have[...], including prevention, diagnosis, cure, care, and palliation”, (Olesen 2000).<sup>15</sup></i>
<b>Elderly Care Physician (ECP)</b>	<i>Doctor working in long-term care for elderly people and chronic patients, mostly in a nursing home. In the Netherlands this is a PC-specialty.<sup>16,17</sup></i>
<b>Primary Care (PC-)setting</b>	<i>The first, community-based medical care. PC-doctors are (among others) GPs or ECPs. The gatekeeping role of PC-doctors makes them responsible for adequate referral of patients to hospital care.</i>
<b>Primary Care resident (PC-resident)</b>	<i>In this study, PC-residents are GP-residents and ECP-residents. The postgraduate PC-training involves a 3 year competency-based program.<sup>18</sup> PC-residents provide patient care in the PC-setting (1st and 3th year). During their 2<sup>nd</sup> year, PC-residents undertake other placements among which in a hospital (6-9 months) .<sup>17</sup></i>
<b>Medical Specialist (MS)</b>	<i>Doctor providing specialist medical care. Mostly offered in hospital settings, where both inpatient and outpatient clinics are combined.</i>
<b>Medical Specialist resident (MS-resident)</b>	<i>Doctor in training for MS. The postgraduate MS-training involves a 4-6 year competency-based program. MS-residents provide patient care in a hospital.</i>

**Box 1. Definitions of professionals and settings within the Dutch healthcare system**

## METHODS

We carried out a constructivist ethnographic study. A constructivist approach acknowledges that researchers' background assumptions, disciplinary perspectives and programmatic efforts along a line of study shape their research processes and conceptual emphases. Therefore, in our study, particular time and attention was paid to reflexivity throughout the research process on how our assumptions and perspectives have shaped our data collection and interpretation. The research group consisted of general practitioners, educational scientists, a psychologist, an internist, a geriatrician, and a medical student. All group members were experienced in providing intraPE and/or conducting research into intraPE in different contexts. This multidisciplinary research group functioned as a form of



triangulation as it brought together disciplines whose profession and/or training calls on highly different assumptions and knowledge areas.<sup>19,20</sup> An experienced psychologist (NL) and a medical student (MW) performed the observations and interviews. Both researchers were trained in qualitative methods and analysis. For the ethnographic research, these researchers were trained during this study by an anthropologist and an educational science researcher.

### **Rapid Ethnography**

We used a non-participatory rapid ethnographic research approach.<sup>21</sup> Particularly in healthcare and medical education research, ethnographic approaches have been considered appropriate to study professional groups, sociocultural aspects and the organization of healthcare and medical education.<sup>22,23</sup> Lingard et al. (2012) describe how ethnographic research is well-suited for capturing the complexity of the daily practice of interprofessional education and collaboration.<sup>24</sup> Compared to classic ethnographic research, which focusses on understanding a cultural phenomenon, a rapid ethnographic research approach prescribes that researchers enter the field with a more well-defined and focused research question and scope.<sup>21,23,25,26</sup> Rapid ethnography-based methods provide a means of collecting data within a short, well-defined timeline by using triangulation of observations, in-depth interviews, and theory.<sup>21</sup> In this study, we collected data by observations in daily practice and in-depth interviews to gain insight into what is already being done and to explore opportunities and barriers for learning intraPC between PC- and MS-residents within hospital placements.

### **Study setting and inclusion**

Using purposeful sampling techniques, we sampled emergency departments and geriatric departments of both academic and regional hospitals, in the Netherlands. After inclusion, we announced our visit with posters and emailed an information letter with the purpose of our study including an invitation for the interview to all residents and supervisors. For the interviews, we applied purposive sampling including snowballing. We sampled younger and older residents and supervisors and we talked about the results with participants. This allowed us to gather broad and deep information of learning intraPC during hospital placements. We excluded residents and supervisors who worked in the hospital department for less than one month.

### **Data collection**

Data collection through observations and in-depth interviews was piloted by one researcher (NL). Two researchers (NL, MW) then performed the observations and in-depth interviews. Prior to our visit, we agreed with the supervisor which moments would be observed. Work-related activities and settings with potential intraPE moments were observed, for example, educational sessions, team meetings, mutual consultations, and daily administrative

work practice. Both researchers were familiar with the context of hospital placements.<sup>23</sup> They immersed themselves in the flow of events including informal conversations. We only performed observations at locations where no patients were involved. To improve internal reliability, the researchers carried out the first two observations and in-depth interview together and determined and discussed differences. During the observations, the researchers made hand-written fieldnotes, that were transcribed the same day. During short observations, we produced short and direct reports instead of a thick traditional description.<sup>21</sup> The fieldnotes and reports were transformed into descriptive notes and were used to inform the interview questions. This means that a different set of questions have been asked of all participants. After the interviews, all field data were anonymised.

The interviews were semi-structured; the interview script (Additional file 2) was designed by four investigators (NL, MW, CF, NS). The interviews were performed after a couple of observations, to ensure that the researchers had enough time to read the fieldnotes and formulate additional questions. The interviews were all conducted in person: 39 in a private room at the hospital department, and three by phone. Participants were compensated with a gift card (value €20). All interviews were recorded, anonymised and transcribed verbatim.

### **Data analysis**

Transcripts of the interviews were analysed using a template analysis method.<sup>27</sup> We choose for template analysis as in this way we could handle the large data set more comfortably than some other methods of qualitative data.<sup>28</sup> The use of a priori themes within template analysis helps focus on themes that need to be incorporated into the analysis. A first template was developed by NL and MW. The codes of this preliminary template were derived from the main questions from our interview guide but also arose from inspection of the data.<sup>27</sup> After each day of observations and interviews, the researchers (NL, MW) discussed their findings. The first three interviews were coded by two researchers (NL, MW) leading to an initial coding template. After re-reading our data and discussing our template we decided to use this template as this would represent the data as fully as possible. It contained higher level codes (representing major themes) and low to lower-level codes, representing more specific topics. The next 39 interviews were analysed with members of our multidisciplinary coding team consisted of NL, MW, MV, CF, NS and EG in various combinations. NL coded and analysed all interviews to provide continuity. Finally all 42 transcripts were double-coded by the research team.

The vast quantity of data, compounded by 45 hours of observation and 42 interviews, made analysing data and finding patterns complex.<sup>25</sup> Due to a clear distinction between three different groups (supervisors, PC-residents, MS-residents) and the use of a template analysis method in a large research team, we were able to properly analyse the large data set.<sup>28</sup>

The research group (NL, MW, NS, CF, EG, JdG) discussed the data iteratively; all inconsistencies in applications of the codebook were discussed and resolved through consensus. Based on the discussions NL adjusted the template. During the coding process NL discussed the results with CF who is a researcher in the field of workplace learning. These discussions helped challenge NL's interpretation of the data and introduce alternative interpretations. After analysing the interviews, the fieldnotes of the observations were reread to check for discrepancies between fieldnotes and interview data. The number of observations and interviews was determined by theoretical sufficiency.<sup>29</sup> Data collection was finished when the research group concluded to have reached 'meaning saturation'<sup>30</sup> and conceptual depth to answer the research question.<sup>29</sup>

### **Ethics**

This study was reviewed and approved by the medical ethical review board of the Dutch Organisation for Medical Education (NERB nr. 983). Written informed consent of all participants was obtained before participation. In some cases, nurses, (para)medical professionals and medical students, were visible during the observations and therefore they were asked for informed consent to be observed, after receiving an information letter on the day of our observations.

## **RESULTS**

We conducted 45 hours of observations (10-360 minutes per observation) and 42 interviews (18-50 minutes per interview) with 14 PC-residents, 14 MS-residents, and 14 supervisors at three emergency departments and three geriatrics departments of five hospitals from February to May in 2018 (table 1 and additional file 1).

A prevailing view amongst all PC- and MS-residents and supervisors was that intraPE is essential and needs explicit attention including dedicated time.

*MS-resident1\_H3: To me, it (intraPE) is super important, and it should receive much more attention.*

All participants indicated that hospital wards are rich in opportunities to learn intraPC. To actually benefit from these opportunities interventions are needed. After categorization of the results, we identified three main themes: 1. Incidental and purposeful learning, 2. Competing professional roles, 3. Work environment. In relation to these three themes, residents and supervisors mentioned clear recommendations for the introduction and implementation of intraPE during hospital placements.

Participant	Total	Man	Woman	Age (range)	year of specialty training
<b>Primary Care residents</b>	14	5	9	<b>32.2</b> (28-50)	years in training: 2
<i>GP-residents</i>	11	4	7		2
<i>EP-residents</i>	3	1	2		2
<b>Medical Specialist residents</b>					
<i>ER-residents</i>	14	5	9	<b>30.5</b> (26-37)	years in training: (1-5)
<i>Geriatric-residents</i>	6	2	4		1,1,1,3,3,3
<i>Surgery-resident</i>	5	1	4		3,3,5,5,5
<i>Internal-residents</i>	1	1	0		1
<i>Hospitalist*-resident</i>	1	0	1		5
	1	1	0		1
<b>Supervisors (Medical Specialists)</b>	14	7	7	49.6 (34-64)	9,6 years (1-18) supervising experience

**Table 1. Participants for observations and interviews**

*\*New specialisation in the Netherlands for generalist doctors within the hospital.*

*Abbreviations: ER, emergency care; ECP, Elderly care physician, GP, general practitioner*

## Theme 1. Incidental and purposeful learning

Our data showed that learning intraPC in the hospital ward occurs by two routes: incidental (implicit learning activities) and purposeful (explicit learning activities).

### Learning implicitly and incidental

The majority of intraprofessional learning activities occurred implicitly during daily work activities. While working, PC-residents learned about the daily hospital-routine: substantive medical skills, how to best refer a patient to the hospital, and how to formulate an adequate referral question. PC-residents usually learned these skills from the supervisors in the hospital department. Supervisors also operated as a role model in intraPC; MS-residents often copy their behaviour. MS-residents learned about possibilities and limitations in the PC-setting and referral patterns, mostly from PC-residents. Residents mentioned that the learning of intraPC mainly occurred incidentally, without conscious reflection.

*PC-resident1\_H2: 'Some attention is paid to intraPC, but it is not really high on the agenda. You do notice that they know PC-residents are walking around and sometimes get questions f.e. 'is that possible in the nursing home?' or 'how do you see that as GP?' or 'How would you feel if we discharge such a patient?' This kind of interaction happens spontaneously'*

## Learning explicitly and purposeful

We observed that intraPE is purposeful and planned in some departments, especially in departments with a collaborative culture, dedicated time for intraPE and intraPE mindset from the supervisor (see box 2).

## Role of supervisor in purposeful learning

PC-residents indicated that some supervisors consciously stimulate interaction between PC-residents and MS-residents and encourage PC-resident to show their PC-expertise.

PC-resident1\_H5: *I always try to share my PC-vision [...] It is a positive thing, that they really appreciate it that I have a vision as a general practitioner. And I also get to hear that they (supervisors) really like it that I contribute my PC-opinion. That is of course stimulating*

Supervisors mentioned that they find it difficult to coach and assess the learning of intraPC for residents from different backgrounds. Their expertise is based on specialist medical knowledge and skills, and they feel competent in teaching in this area, but offering

**A joint intraprofessional team reflection followed directly after the weekly intraprofessional grand round at the geriatrics department. This form of intraPE occurs every Wednesday from 9 a.m. to 10 a.m.**

*During the grand round today, 11 participants are participating: supervisors, MS-resident, PC-residents (general practitioner (GP-resident) and elderly care physician (EP-resident)), and medical students. Each patient is seen by a PC-resident and a MS-resident together (in various combinations), the other participants are observing this intraprofessional consultation. After this grand round, a joint team discussion/ reflection takes place in the handover room. Everyone is seated around the table. One of the PC-residents (GP-resident) presents a patient, followed by discussion between the two PC-residents, supervisor 1 and supervisor 3. Supervisor 2 is observing and supervisor 4 occasionally asks questions during this discussion. When the discussion is about medication for the patient, the GP-resident asks: "is this the regular medication for this type of complaints (problem behaviour)?" The EP-resident shakes his head "no". Supervisor 1 invites this EP-resident to explain the elderly care guidelines of problem behaviour. EP-resident explains the updated guidelines for problem behaviour (used in primary care). Supervisor 1 says: "thus, we cannot provide medication for the treatment of problem behaviour, due to lack of evidence for the effect of medication on problem behaviour". Supervisor 4 asks the other residents and medical students: "can you follow our thoughts?" The supervisors invite everyone to ask questions and to share their expertise.*

*Note observer: The atmosphere is relaxed, there seems to be enough time and space for questions and education, residents and students are invited to share knowledge and to ask critical questions. There is room for one's own opinion and disagreeing with each other, the atmosphere remains relaxed and respectful.*

### BOX 2. Fieldnote\_R1\_H2

intraPE poses specific demands beyond their primary expertise. In order to provide intraPE, supervisors feel a need to study new knowledge and skills about collaboration.

*Supervisor2\_H2: What I mention about just (the use of) theories about collaboration, we haven't done it before, but lately occasionally. Yes as a doctor, you know very little about that, we just do it. Sometimes it goes well and sometimes it doesn't work. Things like that are, I should delve into it (theory about collaboration).*

### **Placement goals**

Both, PC-residents and MS-residents indicated that learning intraPC is essential, but they are not always aware of opportunities to learn this. Residents are accustomed to operating and learning separated from each other and indicate that intraPE is generally not in their mindset.

*MS-resident1\_H2: I can ask her (PC-resident) 'how are things organised in your PC-setting?' We do discuss such things, and she tells me a lot about that [...] But really learning to collaborate, no. We are each on our own island, and you occasionally ask something about 'how are things going on your island'.*

MS-residents often teach PC-residents about their medical specialty and how the hospital is organized, but they hardly ask for PC-expertise, with the result that PC-residents think that MS-residents do not want to learn from them. This means that learning is predominantly unidirectional.

*PC-resident1\_H5: Of course I learn a lot from his or her (MS-resident) knowledge and skills [...] Conversely I have the idea that they learn less from us. And that they do not really want it either. Then it is a bit of one-way learning.*

Residents and supervisors reported that intraPC receives at best limited attention in the training programs as a competency to be learned during hospital placements. Therefore the learning predominantly depends on residents' individual mindset for learning intraPC to formulate learning goals within this domain. Some supervisors would like to oblige PC-residents to formulate a learning goal for intraPC, but supervisors indicated that they never oblige MS-residents to formulate such a learning goal.

*Supervisor 2\_H6: PC-residents have different (training) goals and portfolios than MS-residents. And they (PC-residents) steer very much on their own learning objectives. So then you might have to make a standard learning goal for them. That you say that the collaboration between PC-residents and MS-residents is one of the learning goals for all PC-residents who come here.*

PC-residents expected attention for intraPC during release days, where PC-residents learn among their peers at the PC-specialty training institute once a week, but they indicate that intraPC receives only limited attention.

**[question: are learning intraPC and sharing PC-expertise themes during release days]** PC-resident2\_H6: *Very few actually and that surprised me. I thought that there would surely be attention (for intraPC), also for the collaboration with the elderly care physician. But that (intraPC) is actually not discussed at all.*

## Theme 2. Competing professional roles

The observations and interviews showed that PC-residents often adjust to the role of MS-resident providing specialist medical care during their hospital placement as if they are in training for that MS-specialty. The majority of PC-residents hardly ever share their PC-knowledge and -skills, except when invited.

MS-resident1\_H6: *The PC-resident steps into our MS-role and that is also what is (implicitly) expected. It is a fact that they act just as MS-residents; they have to drop their PC-role to say the least.*

SUP2\_H3: *During handovers, when we discuss the patient's discharge we don't know if a GP can do anything with our suggestions. Then, we should explicitly invite PC-residents to say how their view is; they don't do that on their own"*

PC-residents, who continued to adapt to the role of MS-resident and barely expressed their professional PC-identity, sometimes even were not aware of their PC-knowledge and skills.

PC-resident2\_H6 *And he (MS-supervisor) told me 'you have to ask hard questions to the other disciplines like how far will we go in our decisions?' And then I thought, off course, that is actually something I normally do in primary care. Well, I won't say that I really forgot it, but I think that I was too much in the MS-role.*

PC-residents, who easily switched between MS-role and their professional PC-identity, were more explicit and proactive in demonstrating their PC-expertise.

PC-resident1\_H4: *I also give some kind of information back to the specialists which they can use. I see myself more as a general practitioner within the ER. I know something about emergency cases, and I also know a lot about general practice. With that, I can also put them (medical specialists/MS-residents) in the right direction.*

### **Theme 3. Work environment**

A prevailing view amongst participants was that learning intraPC between residents is only possible when a safe work-learning climate and significant practicalities are secured.

#### ***Work-learning climate***

We observed that the placement of residents within the room during team meetings can reflect (in)equality. Within some departments, everybody was seated equally in the room. In other departments, PC-residents were not sitting around the table among other MS-residents, but sitting or standing in the second rank. The discussion took place at the table and the second rank (PC-residents) was acting as a kind of spectator. The placement of residents was affecting the chances for intraPE.

*Fieldnote\_R2\_H4: The medical specialists are sitting at the head of the U-form table, and the MS-residents are sitting on the sides of the table. The PC-resident is sitting on the second row, together with undergraduate students. The PC-resident is the only doctor who have to take place second rank between the students.*

Another essential aspect to create a safe work-learning climate is 'knowing each other', for example by having a drink together outside the ward. Residents and supervisors who know each other informally report that they get in touch with one another more easily, understand why people react the way they do and are more likely to invest in each other. Participants mentioned that hierarchy, such as between supervisor and resident, is useful as it clarifies roles and responsibilities within the hospital. Nevertheless, they indicated that too much power dynamics in the hospital ward can lead to a lack of respect and inequality which has a hindering effect on building a relationship to get to know each other's expertise. Supervisors and residents mentioned that the way how MS speak about PC-doctors can be responsible for creating a (un)safe work-learning climate for intraPE.

*PC-resident3\_H1: Sometimes medical specialists talk about primary care doctors in a negative way, like it's an inferior specialism. And sometimes I hear such comments during meetings between shifts, that is of course demotivating.*

Participants mentioned that supervisors are in the position to steer power dynamics, and within some departments, supervisors showed an active policy against unconstructive power dynamics.

#### ***Practicalities***

IntraPE can hardly take place when PC- and MS-residents are working in different shifts or having different offices. Supervisors and residents indicated that the opportunity to meet



each other is necessary for intraPE to take place. This is possible by sharing physical space together.

*Supervisor2\_H5: We are in a set-up in which we sit in a circle (behind computers) and where you easily pick up things from each other. And then an interesting (intraprofessional) discussion, a case-based discussion arises spontaneously.*

### **Residents' and supervisors' perceived needs**

In relation to the above themes, residents and supervisors mentioned clear recommendations to identify the different workplace activities for learning of intraPC and to explicitly integrate workplace opportunities: 1. The specific organisation of work context by creating actual possibilities for learning intraPC, 2. Explicit and purposeful learning of intraPC during workplace activities, by both PC-residents and MS-residents, 3. Supervisors taking responsibility for intraPE by facilitating constructive work-learning climate and further professional development in intraPE, 4. IntraPC as a placement goal for both PC-residents and MS-residents, 5. Empowerment for PC-residents to share their PC-expertise; 6. Empowerment of MS-residents to ask for PC-expertise 7. Offering placements for MS-residents in the PC-setting.

*Supervisor2\_H3: It (intraPE) must be integrated in the placement/work structure. When it is something optional or incidentally, then it will not work out.*

*MS-resident1\_H6: For example case-based discussions, where we discuss the kind of cases that we all recognize. And that we also hear their (PC-residents') side of the story and also hear from them what they encounter when collaborating with us, and vice versa. I think that is very important.*

*MS\_resident1\_H3: For us (MS-residents), a placement in a nursing home would also be a very good idea. That is not at all in our training program [...] It can sometimes be quite difficult if you have no idea at all about how it works in a nursing home [...] I think it is very good that we make that more transparent and learn from each other.*

*PC-resident1\_H6: I think that we will only get a real collaborative relationship if they (MS-residents) also come along when I am in the primary care practice.*

## DISCUSSION

All participants found intraPC essential for good healthcare and consider hospital wards rich in opportunities for learning intraPC. However, we also report that these opportunities are seldom exploited due to various reasons. Firstly, intraPC learning goals are often not apparent and both, residents and supervisors lack awareness of the intraPC learning opportunities. When learning intraPC occurs, it is predominantly implicit. Secondly, PC-residents often adapt to the role of MS-resident and hardly share their PC-expertise. MS-residents often neglect to search for PC-expertise. Thirdly, too much hierarchy led to inequity, which had a hindering effect on building relationships and formed a not safe enough work-learning climate in which residents did not feel free to speak up. Therefore improvement in mindset, professional identity and power dynamics are crucial to facilitate and promote intraPC.

### Mindset

When learning intraPC occurs between PC-residents and MS-residents, this is mostly random through informal mechanisms: the learning occurs implicitly, spontaneously and with little conscious reflection, which is in line with the description of Watkins & Marsick (1992) about informal and incidental learning.<sup>31</sup> To our knowledge, our study is the first to investigate intraPE during hospital placements. Our findings are consistent with previous studies on other contexts, which also showed that learning collaborative competences lack structured implementation and is generally not in the mindset of medical professionals.<sup>11,32,33</sup> Residents are expected to learn during their postgraduate training, and therefore, it could be expected that they are always on the look-out for learning opportunities. However, with regard to intraPC, this happens only to a limited extent.

Frequently, mindset is associated with the growth mindset theory from Dweck.<sup>34</sup> However, in social psychology and organizational leadership, mindset is seen as a cognitive filter through which one looks at the world, a pre-defined reference frame, "used throughout the totality of an individual or organization's cognition".<sup>34</sup> Johnston (2019) clearly recasts a long-standing idea when she states that "excellent medical education occurs in secondary care settings" and elaborates that primary care has an "inferior status" and is considered to be much less advanced.<sup>7</sup> Consequently, MS-residents teach PC-residents, but they are not accustomed to asking for PC-expertise from PC-residents, maybe not realizing or appreciating their PC-expertise. MS-residents rarely have placements in PC-settings. These historical patterns can lead to a mindset for predominantly unidirectional learning at the workplace. Uhlig et al. (2018) described that, in order to successfully realize interprofessional collaboration, many deeply-rooted patterns, role cultures and assumptions must be carefully adjusted.<sup>35</sup> Our results underscore that MS-supervisors and PC-teachers have an important role in creating a mindset for learning intraPC. They

can do this by formulating placement goals for both PC-residents and MS-residents and by stimulating two-way learning and conscious reflection.<sup>36,37</sup>

The above implicates that intraPE requires responsibility of all parties involved: PC-residents, MS-residents, supervisors, teachers and program directors.

### **Professional identity**

In the Netherlands, the purpose of the hospital placements for PC-residents is to gain expertise in emergency care and diseases that are not very prevalent in a PC-setting, and to learn intraPC with medical specialists. We found that PC-residents often adapt to the role of MS-resident. This is useful for learning medical skills and to fit into the hospital team. However, the majority of PC-residents hardly share their PC-expertise. This is counterproductive for learning intraPC. At first glance, the PC-resident appears to have little influence on the dynamics of an expert team within the hospital ward. However, our results show that also temporary team members can bring a fresh eye to common practices. We found that PC-residents who expressed their professional PC-identity and easily alternate between the MS-role and PC-role, created intraPC discussions and bidirectional learning. Previous literature shows that pre-existing teams are more receptive to the influence of newcomers when the newcomers are more assertive.<sup>38</sup> Proactive PC- and MS-residents would also rapidly take charge of their intraPC learning process once they are included in the learning cycle.<sup>31</sup> This stresses the importance of empowering PC-residents to express their professional identity and to proactively share their PC-knowledge and empowering MS-residents to proactively ask for PC-knowledge.

### **Power dynamics**

The participants mentioned that hierarchy is useful to clarify roles and responsibilities within the hospital, but too much hierarchy can create inequity. Power is enhanced through the hierarchies in which residents interact.<sup>39</sup> Hierarchy or power dynamics are barely investigated within intraPE;<sup>40</sup> only Meijer (2016) mentioned hierarchy.<sup>11</sup> In their study hierarchy did not seem to influence intraPE, which is contrary to our findings. This discrepancy may be attributed to the fact that their residents only interacted by telephone and letter; power dynamics may be less prevalent during telephone and letter interaction. Studies about hierarchy and power dynamics within interPE confirm our findings.<sup>41,42</sup> Baker (2011) warned that attention should be paid to factors causing hierarchy; otherwise, interPE can increase competition and unequal power relationships (power dynamics) between professionals, which has a reverse effect on collaboration.<sup>41</sup> Edmondson (1999) demonstrated that in working teams learning behaviour, such as sharing perspectives, asking questions and seeking feedback, is highly dependent on team psychological safety: "a shared belief that the team is safe for interpersonal risk-taking".<sup>43</sup> Power dynamics can have a corrosive effect on psychological safety,<sup>44</sup> and therefore on learning intraPC between residents. Meanwhile, informal relations are related to psychological safety.<sup>44</sup> We

found strong evidence that learning intraPC between residents is influenced by the degree of equity and informal relations in the hospital department. This has been identified in earlier studies as well.<sup>11,32</sup> Janssen et al. (2017) showed that interaction between residents and supervisors, in which they take each other seriously, is a crucial factor in intraPE.<sup>32</sup> Meijer et al. (2016) concluded that knowing each other makes learning intraPC between GP-residents and MS-residents much easier.<sup>11</sup> Our study shows that equity and informal relations are promoted by practical issues such as sharing physical space, sitting equally in the room around the table among others, dedicated time together, having a drink together outside the workplace and speaking respectfully about each other.

### **Strengths and limitations**

Strengths of this study are the use of four types of triangulation: method, data source, investigator, and research group triangulation.<sup>45</sup> An interprofessional research group brought together disciplines with highly diverse assumptions and different knowledge bases,<sup>19,20</sup> and triangulation allowed researchers to examine different data sources to confirm and contrast findings.<sup>45</sup> The psychologist for example had a keen eye for the effects of the possibilities to adjust hierarchy, and the general practitioner focused on elaborating the importance of sharing PC-expertise.

We consider the variability in nature of the observations as a strength. The short observations consisted of five meetings below 15 minutes. These were meetings to start the day in an interprofessional way. Although short, these meetings provided us with very rich observations with respect to (opportunities for) intraPE. Because our observers were familiar with the context of hospital placements these could easily recognize relevant activities. Another strength is the cooperative attitude of residents and supervisors to participate in this study; we had to cancel some hospitals -that had applied to participate- after conceptual depth was reached. Because of this cooperative attitude, we could get a rich conception of the potential of hospital placements for learning intraPC.

We acknowledge several limitations. Our presence, during observations, may have had an impact on the participant reactivity, which is defined by Paradis and Sutkin (2016) as: "a form of participant effect that comes from participants' active engagement with the research and its aims, leading to behavioral adaptation that aligns with perceived social norms".<sup>46</sup> We think we minimized participants' reactivity by embedding in the environment and checking our observations during the in-depth interviews with the participants.<sup>23,46</sup> Observers were dressed in a hospital uniform and we undertook at least four observations at every hospital department. We noticed that people did interact with us as if we were new colleagues and continued their actions seemingly uninterrupted, especially when we revisited departments. Another limitation is that we only performed observations in locations where no patients were involved. Therefore, a part of informal learning intraPC

remained outside the scope of our study. By practicing reflexivity in an interprofessional research group, we think this limitation was reduced as much as possible.

### **Implications for practice and future research**

When organizing the learning of intraPC through placements for residents from different medical backgrounds, we think the following should be kept in mind: 1. Informal learning can be planned or unplanned, but it involves at least some conscious reflection.<sup>31</sup> It is necessary to implement intraPE within workplace-based learning, to make the learning of intraPC purposeful; 2. The hierarchy must be taken into account, e.g. by sharing a room and sitting equally around the table, asking for different perspectives, letting PC- and MS-residents speak first during discussions and then letting supervisors add their information; 3. Supervisors need extra training to be aware of and create learning opportunities and to create a mindset for learning intraPC. 4. Residents need some extent of professional identity to be able to show their expertise and for supervisors to steer intraPE. A professional role-identity is developed from a combination of personal factors, working environment and role modelling.<sup>47-49</sup> However, PC role-models are absent during hospital placements. Therefore, peer-to-peer meetings during placements could be a valuable alternative.<sup>49</sup> We recommend release days, where PC-residents learn in dialogue with their peers about intraPC. Future research is needed to investigate how the development of professional role-identity can be supported, and how power dynamics can be managed in a constructive way.

### **Conclusion**

All residents and supervisors indicate that learning intraPC is essential and requires more explicit attention. IntraPC is not learned spontaneously during hospital placements. Even in a promising setting where PC-residents and MS-residents work together in the same department, intraPC receives at best limited attention as a competency to be learnt. MS-residents are not accustomed to asking for PC-expertise and PC-residents often adapt to the role of MS-resident and they hardly contribute their PC-knowledge. Hierarchy with lack of psychological safety at the hospital department negatively influences the learning of intraPC. We conclude that in order to benefit from the opportunities to learn intraPC during hospital placements, attention to mindset, professional identity and power dynamics is needed. Learning intraPC is promoted when there is a collaborative culture (with not too much hierarchy), dedicated time and goalsetting for intraPC and support from the MS-supervisor on the ward and PC-teachers during release days.

## ADDITIONAL FILES

Hospital departments: six departments in two academic and three regional hospitals		
Hospital	Academic	Regional
A	Emergency department	
A	Geriatrics department	
B		Geriatrics department
C		Emergency department
D		Emergency department
E	Geriatrics department	

**Additional file 1.** Included hospital departments

Domain	Question (example)
<b>General</b>	<i>How do you think about learning intraprofessional collaboration during this hospital placement?</i>
<b>Current situation</b>	<i>Can you give an example of intraprofessional education during your current hospital placement?</i>
<b>Possibilities</b>	<i>Do you see possibilities for learning intraprofessional collaboration (between primary care and medical specialist residents)/within your current rotation?</i>
<b>Obstacles</b>	<i>What are the factors that could hinder intraprofessional education within your current internship?</i>
<b>Specific for a discipline</b>	<i>Primary care trainee: to which extent do you act as a medical specialist resident?</i>
<b>In response to the observations</b>	<i>Questions to clarify what is seen during the observation</i>
<b>End</b>	<i>Do you know colleagues who think differently about intraPE than you do?</i>

**Additional file 2.** Interview guide with starting questions

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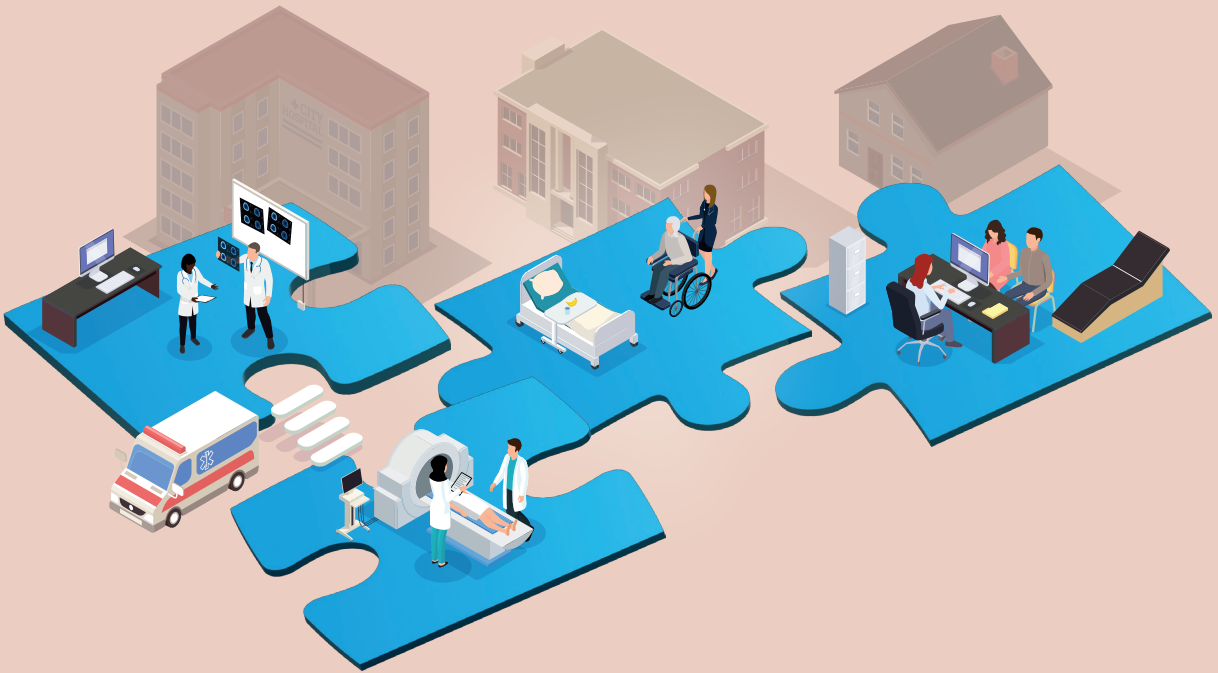




*“Diversity is being  
invited to the  
party;  
Inclusion is  
being asked to  
dance”*

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**Vernā Myers**



# CHAPTER 4

## Exploring power dynamics and their impact on intraprofessional learning

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# **ABSTRACT**

## **Context**

During postgraduate training, considerable efforts for intraprofessional education are in place to prepare primary care residents (PC residents) and medical specialty residents (MS residents) for intraprofessional collaboration (intraPC). Power dynamics are inherently present in such hierarchical medical contexts. This affects intraPC (learning). Yet, little attention has been paid to factors that impact power dynamics. This study aims to explore power dynamics and their impact on intraPC learning between PC residents and MS residents during hospital placements.

## **Methods**

This study expands on previously published ethnographic research investigating opportunities and barriers for intraPC learning among residents in five Dutch hospitals. We analyzed transcripts of observations and in-depth interviews using template analysis. A critical theory paradigm was employed. Discourse analysis additionally informed the data.

## **Results**

We defined five interrelated themes that describe characteristics of power dynamics in intraPC learning during hospital placements: beliefs; power distribution; interaction style; subjection; and fearless learning. Power dynamics operate both within and between the themes: power distribution between PC residents, MS residents and MS supervisors seemed to be an attribution affected by underlying beliefs about professional norms or about other professions; beliefs influenced the way PC residents, MS residents and MS supervisors interacted; power distribution based on inequity could lead to subjection of PC residents; power distribution based on equity could lead to fearless learning; and open interactions enabled fearless intraPC learning.

## **Conclusions**

Power dynamics have an impact on intraPC learning among residents in hospitals. Constructive power dynamics occur when power distribution is based on equity, combined with sincere open interactions, actively inviting each other into discussions and enlisting the support of MS supervisors to foster fearless learning. This can be achieved by creating awareness of implicit beliefs and making them explicit, recognizing interaction that encourages intraPC learning and creating policies that support fearless intraPC learning.



## INTRODUCTION

Collaborative practice between primary care (PC) physicians and medical specialists (MSs) is vital and requires mutual trust and respect.<sup>1-4</sup> In the deep-rooted hierarchical contexts of hospitals, however, it could be a measure of status for MSs to disrespect lower-status professionals with impunity,<sup>5</sup> such as PC physicians.<sup>3,6,7</sup> Power dynamics based on traditional hierarchies are inherently present in (intra)professional interaction and learning processes<sup>5,6,8-10</sup>, and could have an adverse effect on collaborative practices<sup>5,8</sup> leading to adverse events in healthcare.<sup>3,11</sup> Often power dynamics are not openly discussed, but referred to implicitly, contributing to the hidden curriculum.

To prepare primary care residents (PC residents) and medical specialty residents (MS residents) for collaborative practice, the learning of intraprofessional collaboration (intraPC) through intraprofessional education (intraPE) is an emerging part of postgraduate training.<sup>12-18</sup> For example, hospital placements, where PC residents and MS residents work together at the same department, provide several opportunities for intraPE.<sup>15</sup> These placements occur worldwide.<sup>15,37-41</sup> A Dutch study found that PC residents, MS residents and MS supervisors mentioned issues with power dynamics that influenced intraPC learning during hospital placements.<sup>15</sup> Arabic studies have found that the personal attitude of MSs can make PC residents experience inferiority or feel inferior, leading to deficiencies in learning during hospital placements.<sup>19,20</sup> Canadian studies, furthermore, have found that more than one-third of the PC residents experience harassment and intimidation arising from power dominance by MSs and MS residents during hospital placements.<sup>21,22</sup> As such, power dynamics can lead to interpersonal fear.<sup>23</sup>

Although considerable efforts are being made to design inter-/intraprofessional education (IPE/intraPE), little attention has so far been given to factors that impact hierarchy and power dynamics.<sup>8,24</sup> The vast majority of studies about IPE/intraPE focus on programs or curricula, but omit to critically investigate the impact of power.<sup>8,25</sup> The same holds true for studies about hospital placements. By not addressing power dynamics, however, an ambiguous and opaque problem remains in place.<sup>25,26</sup> To improve the learning climate for intraPC learning, PC residents, MS residents and their supervisors need to have a better understanding of the impact of power dynamics.<sup>8</sup>

### Theoretical background

In scientific literature, power and power dynamics seem to be easier to recognize than to define. Dahl (1957) explains power as a form of control: "A has power over B to the extent that he can get B to do something that B would not otherwise do".<sup>27</sup> A/B can be a person, team or organization. King jr. (1968) describes power as the ability to bring about change<sup>28</sup> or as the capacity to act or not to act. Raven (2010) defines power as

a form of interpersonal influence which may be based on various sources: expertise, information, (formal) position, being a reference, or the ability to exert coercion or reward.<sup>29</sup> Bynum (2021), finally, elaborates that power hierarchies/distribution in medical learning environments are often manifested through knowledge, vulnerability, risk-taking and influence.<sup>10</sup>

Underlying these definitions are philosophical roots of thinking about power. Arendt (1970) and Foucault (1976) explain that there is not one place or person where power emerges from, but that it is rather constructed between people and continues to exist as long as these people stay together.<sup>30,31</sup> The interaction of power between people can be understood as a dynamic process,<sup>30,32</sup> as an unstable network of practices that spreads throughout society and may exist within workplaces, institutions, or other places where people come together. In this article, we use the term “power dynamics” to describe the way in which power impacts the interaction of two or more people or groups. Power and power dynamics are essentially neutral, not necessarily negative,<sup>31,33</sup> and its manifestation and impact may be constructive or non-constructive.

Prior research demonstrates that the impact of power dynamics between higher status and lower status individuals may be moderated by psychological safety and perceived connectedness.<sup>8</sup> Edmondson defines psychological safety as the extent to which people view the work/learning environment as being conducive to interpersonal risk-taking, such as expressing themselves or asking for help, without fear of negative consequences.<sup>7,34</sup> It has been shown that an unconstructive manifestation of power dynamics can be overcome with high psychological safety, even in contexts with strong hierarchies.<sup>35,36</sup>

## **Research aim**

The aim of this study is to explore power dynamics and their impact on intraPC learning between PC residents and MS residents during hospital placements. The intention here is to enhance the understanding of the nature and extent of power dynamics on hospital wards and to pave the way for future constructive collaborative learning and practice.

## **METHODS**

### **Context and design**

Worldwide, during postgraduate training, PC residents undertake hospital placements in the same departments where MS residents are in training.<sup>15,37-41</sup> In the Netherlands, this means that PC residents work four days a week on the hospital ward together with MS residents; the fifth day is spent with other PC residents at the PC specialty training institute. This current study expands on previously published research by Looman et al.

(2020), which investigated opportunities and barriers to intraPC learning between PC and MS residents during hospital placements.<sup>15</sup>

### **Data collection**

In our previous study, observations and interviews were conducted at three geriatrics departments and three emergency departments of five Dutch hospitals from February to May 2018. During this study, issues of power and power dynamics repeatedly surfaced in interviews, even when power was not initially addressed by the interviewer. After fifteen interviews, we decided to incorporate additional questions to explore this issue deeper in the subsequent 27 interviews. Previous studies on psychological (un)safety in healthcare have recommended taking different power status levels into account, and involving the researcher as an observer in the study setting to observe patterns rather than relying on participants' reports only.<sup>42</sup> We finally used all 42 interviews for this study and included 24 fieldnote transcripts for triangulation. More information on data collection can be found in Looman, et al. (2020).

### **Design**

We decided that the issue of power dynamics needed another theoretical framework than the prior study on opportunities and barriers to intraPC. Due to the current focus on power dynamics and the sensitivity required for such a topic, we employed a critical theory paradigm. Critical theory is a research paradigm that focuses on the experience of people and seeks to understand how social structures shape these experiences.<sup>43,44</sup> Critical theory is concerned with issues such as power and justice and tries to explain how social systems function by looking into discourses, ideologies and institutions.<sup>43,45</sup> In line with this paradigm, a discourse analysis approach informed our data analyses.<sup>45,46</sup> Discourse analysis focuses on the relation between language, practice and power<sup>46</sup> and assumes that it is important to analyze power relations from the viewpoint of the participant.<sup>44</sup>

### **Data analysis**

Transcripts of the interviews and fieldnotes were analyzed employing a template analysis method.<sup>47,48</sup> Template analysis can be accommodated to different paradigms,<sup>49</sup> in this case critical theory and some discourse analysis elements as an additional way of looking at the data.<sup>46</sup> For example, we used mental models and metaphors to analyze the data on a deeper level.<sup>44</sup> Mental models show what people believe about others.<sup>44</sup> Metaphors can reveal beliefs or norms that are normally hidden. We used mental models and metaphors as a discourse analysis approach to explore the power dynamics in our transcripts and to identify implicit forms of power.

Our data analysis started by selecting the relevant material. We combined an inductive and a deductive approach for the operationalization of power dynamics. Two authors (NL

and TW) performed a first round of open coding. NL and TW each independently coded three transcripts. We discussed the results together. Combining these with sources in the literature, we made a preliminary template of power dynamics. We used the preliminary template to select relevant parts of the other transcripts. After that, NL and TW coded six transcripts individually and compared the similarities and differences. Due to different professional backgrounds, we had to settle on some definitions. “Team dynamic”, for instance, was coded when it was negative by NL, whereas TW interpreted it as neutral. We agreed to use it as a negative term and to use work-climate as a neutral or positive term. NL and TW made an initial template and discussed this with the extended team: CF, NS, JdG.

In the second round, NL and TW divided and coded the remaining transcripts individually. Six of the transcripts were again coded by both and discussed in weekly meetings, to keep track of differences and similarities. We discussed and settled on differences by meeting with the whole research team and resolved all inconsistencies through consensus. Differences mainly concerned whether a quote was to be interpreted as neutral or negative, or how to choose a slightly different subcode from a larger overarching category (e.g., *hegemony* or *distance*). Other differences could be traced back to the different backgrounds of the researchers, in which case we opted for an inclusive approach and kept both codes (e.g., *collaboration* and *work-climate*).

Finally, we double coded the fieldnotes and triangulated these with the findings in the coding template. We looked for mentions of power in the fieldnotes and compared these to what the interviewees had said.

## **Reflexivity**

NL is a psychologist and PhD candidate in intraPC/intraPE. Working as a psychologist, her focus is on the underlying aspects of behavior, interaction and equity between people in a work environment. TW has a background in education science and philosophy. She is a teacher trainer and researcher in medical education. She holds an enactivist approach to learning, focusing on the role of affect and environment in learning. DvA is a geriatrician, supervisor and researcher in medical education. She focuses on team behavior in the hospital ward regarding intraPC learning between residents. NS is a general practitioner, director of primary care specialty training and professor general practice in IPC. Her focus is on the role of PC residents with regard to intraPC learning. CF is an MD and educationalist and professor of workplace learning. Her focus is on creating working environments that stimulate learning for both students and professionals, psychological safety and adaptive expertise. JdG is an internist, director of postgraduate medical education and professor of professional performance in PGME. She focuses on hierarchy, psychological safety and policies that affect intraPC learning.

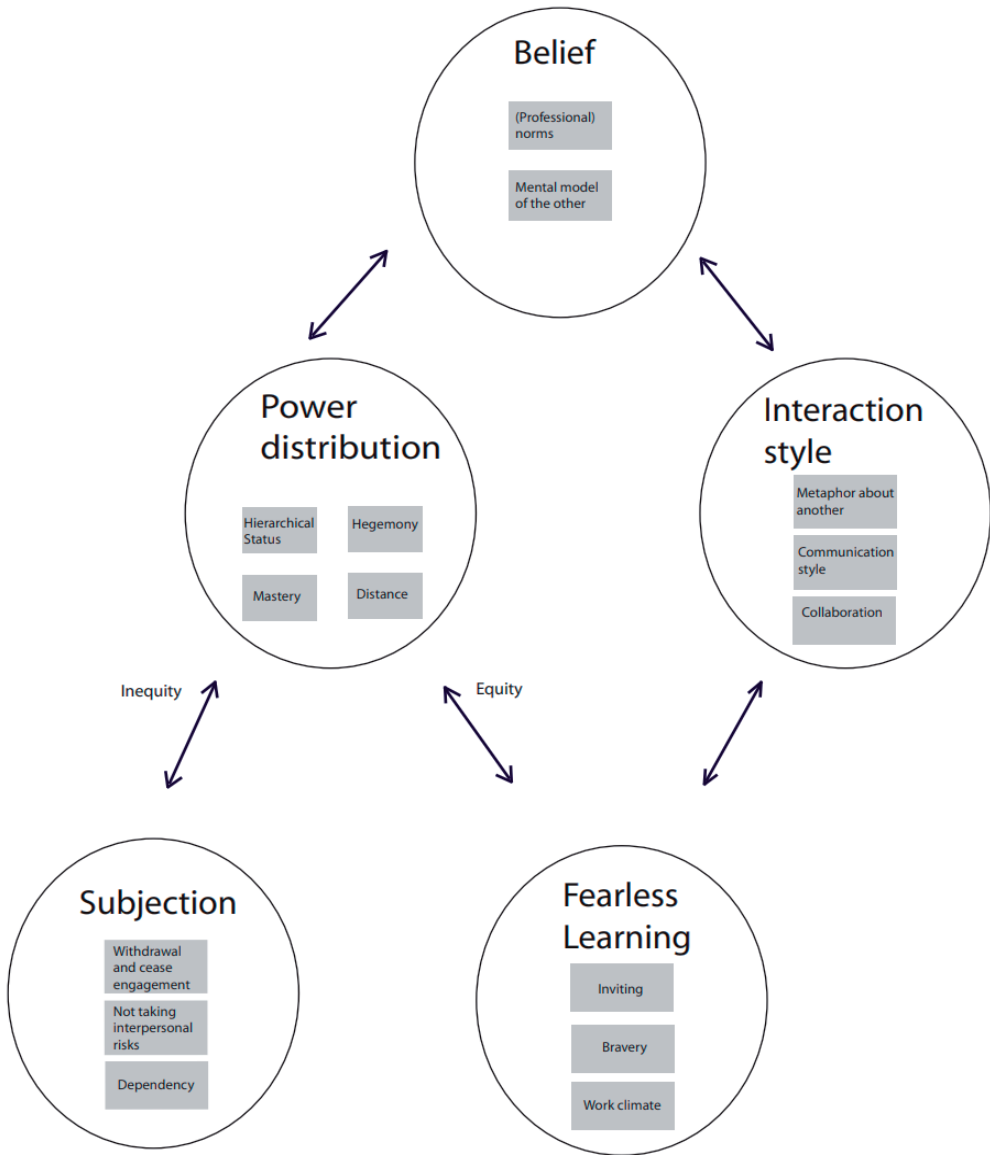
## RESULTS

Based on our analysis, we defined five interrelated themes that describe characteristics of power dynamics in intraPC learning between PC residents and MS residents during hospital placements: A. Beliefs; B. Power distribution; C. Interaction style; D. Subjection; E. Fearless learning (see Table 1).

Theme	Description
<b>A. Beliefs</b>	Participants hold certain beliefs about other professions (mental model of the other) or about existing power systems and standards (professional norms). This concerns beliefs between PC and MS residents and between residents and MS supervisors in hospitals.
<b>B. Power distribution</b>	Power distribution between PC physicians/PC residents, MSs/MS residents and MS supervisors appears to be an attribution and can be based on systems in the organization. Power can be attributed, for instance, as hierarchical status due to mastery of knowledge. Power distribution is part of a system as an existing power distance between medical disciplines (PC and MS) and between supervisors and residents. Power distribution appears to be an intertwining of attribution and system factors, such as a skewed power distance in which MSs/ MS residents have a superior and PC physicians/PC residents an inferior hierarchical/ power status (hegemony). The distribution of power can be based on either equity or inequity.
<b>C. Interaction style</b>	Power is expressed in how participants talk about and with each other, what words they use (metaphors, communication style) and whether the interactions are open and collaborative.
<b>D. Subjection</b>	Subjection is a type of behavior of PC residents in terms of not taking interpersonal risks or withdrawal and ceasing engagement. These behaviors can occur in a dependency relationship between PC and MS residents or between residents and MS supervisors, when power distribution is based on inequity.
<b>E. Fearless learning</b>	A pattern of fearless learning is found to emerge in a safe workclimate, with collaboration being based on equity, proactively inviting each other to participate in discussions and show the courage to speak up, share perspectives and take interpersonal risks.

**Table 1: Themes that describe characteristics of power dynamics in intraPC learning between PC residents and MS residents in hospitals**

The themes appeared to be interacting. The observations and interviews indicated that power dynamics (the way power impacts the interaction between people) occurred both within the themes and between the themes. We described the interrelation between the themes as main types of power dynamics.



**Figure 1.** Main types of power dynamics in intraPC learning

We found five main types of power dynamics in intraPC learning between PC residents and MS residents in hospitals (see Figure 1): 1) beliefs impact power distribution; 2) beliefs impact interaction style; 3) power distribution based on inequity impacts subjection; 4) power distribution based on equity impacts fearless learning; 5) interaction style impact fearless learning. We will elaborate on these themes and on power dynamics in this section.

## 1. Beliefs impact power distribution

Our interviews revealed that power distribution is influenced by underlying beliefs and vice versa. Supervisors mentioned that professional norms, such as mastery of knowledge, determine the level of hierarchical status assigned to PC residents.

*"In that case [if the PC resident has little input], he descends in hierarchy. I think that they measure this [hierarchical status] in discussions, who is saying and doing what, when and where... PC residents who dare to speak up are rewarded for that; they are heard more."*

MS\_supervisor\_D1

Supervisors and residents indicated that the beliefs they hold about each other (mental model) fuel power dynamics between PC and MS residents. PC physicians and PC residents are expected to share information for intraPC, but this is not expected of MSs and MS residents (professional norms). In order to learn intraPC, some MS residents would like to balance this inequality, but they doubt whether they have support for doing so. Several MS residents doubted whether they could learn from PC residents. These beliefs hamper the ability to learn intraPC.

*"There is an exchange on their side [PC physicians/residents], but conversely there is no exchange from our [MSs/MS residents] side... I don't know if people [MS (residents)] would be interested in that [exchange by MS residents], but I do think it would be important in an effort to establish proper intraprofessional care."*

MS\_resident\_D20

*"I'm not sure what we may learn from a PC resident... Do you have a suggestion? ... I do get that PC physicians have limited diagnostics. I can't quite imagine what we can learn directly from PC residents."*

MS\_resident\_D26

## 2. Beliefs impact interaction style

Our interviews demonstrated that beliefs impact interaction style, and, similarly, that the way PC residents, MS residents and supervisors talk about and with each other (often in metaphors) can create/maintain beliefs. Participants mentioned that interaction styles have a major effect on generating a constructive or unconstructive manifestation of power dynamics, which subsequently have a conducive or corrosive effect on intraPC learning (see Table 2).

Corrosive effect on intraPC learning	Conducive effect on intraPC learning
<p><i>“Handovers are a very good way to exchange experiences, to exchange learning points. [...] I do miss that with surgery, but it fits with the attitude of surgeons and the attitude of internal medicine. At the internal medicine department, you’re part of the team, but with the surgeons you’re an accessory/ a sidekick/ that works along [...] There is some alpha male behavior in there. Surgeons react differently if there’s another specialism around. It is the kind of hierarchy I expect from a surgeon. That just belongs there. Actually, I enjoy the spectatorship, you know, I like it. I find myself gawking at their behavior.”</i></p> <p>PC_resident_D3</p>	<p><i>“We assume a lot about what PC physicians can or cannot do. We have all kinds of beliefs and we naturally consider ourselves [MSs] better than PC physicians... Of course, when there is a PC resident in the group, you have to watch what you say about why you might think PCs should have done things differently... I think it’s quite intimidating [for PC residents] sometimes ... What I do when I notice this, is to expressly invite the PC resident to say something about it. Like, ‘this is happening right now, but let’s ask the PC resident in our midst what he thinks about it.’”</i></p> <p>MS_supervisor_D25</p>
<p><i>“That I don’t trust colleagues [PC residents] unless I know they are trustworthy or I witnessed it with my own eyes. You just need to have a healthy kind of suspicion, whilst having to supervise them (PC residents), to check up on them.”</i></p> <p>MS_resident_D38</p>	<p><i>“PC residents may think that they’re a bit inferior to the work here. But really, their expertise could be of use to us as well. Since this is their hospital placement, they want to learn more about clinical geriatrics I think...Whilst it would also be great if it [discussion/ exchange] could also focus on geriatrics in general practice or geriatrics in the nursing home.”</i></p> <p>MS_resident_D20</p>
<p><i>“Cardiology can be condescending. That really seems to be part and parcel of that specialty. ... I don’t think it really matters that I’m a PC resident. It’s just that they’re used to saying ‘here comes primary [emergency] care again with a stupid question’... that could affect me in terms of learning from each other, because you’re less inclined to ask each other questions.”</i></p> <p>PC_resident2_D6</p>	<p><i>“We [MSs] often have an opinion about PC physicians. When a patient is referred too late we think: ‘they can’t do anything correctly, they’re often incorrect, other times they missed it [a diagnosis], or acted too late. See, here we go again...’ But we don’t get to see everything that goes well. So we have a distorted image of their reality. We don’t know the limitations they have. But by having PC residents over, you notice that we start labelling such things differently. We ask more openly, verify things with them. And so we engage with them [PC( residents)] respectfully and more constructively.”</i></p> <p>MS_supervisor_D19</p>

**Table 2:** Interaction style: the way PC residents, MS residents and MS supervisors talk about and with each other, often in metaphors

Table 2 shows that PC residents, MS residents and MS supervisors have biases and judgmental beliefs about each other, which could lead to tense interactions that impede intraPC learning. As supervisors D19 and D25 noted, awareness and recognition of beliefs could be a first step in balancing power dynamics, followed by a respectful interaction with careful language and actively inviting each other to participate in discussions.



### 3. Power distribution based on inequity impacts subjection

Our data indicated that power distribution between PC residents, MS residents and MS supervisors is an attribution, e.g., hierarchical status due to mastery of knowledge, and can be based on systems in the medical context or organization e.g., existing power distance between MSs and PCs or between supervisors and residents. Power distribution seemed to be an intertwining of attribution and system factors. We observed that power distribution based on inequity (hegemony) between PC and MS residents or between MS supervisors and residents shapes unconstructive power dynamics. Residents sometimes feel that the PC residents' voice does not count or is overridden. This can lead to less interpersonal risk-taking or ceasing engagement or subjection of the PC resident, which could have a destructive effect on intraPC learning.

*"I would be less likely to initiate a discussion about it... I can share my PC guidelines, but they just get swept off the table. At that point I just think... fine... I'll just act submissively here and we can do this the way you want to do it."*

PC\_resident\_D14

*"They allowed me to tag along, so I was there to watch and to listen what this one physician was saying. And then I had to decide whether I would start a discussion to share my [PC] point of view whilst I could see that this person was not really open to it... I didn't believe he was inclined to change his mind. Well, perhaps this was a bit lazy of me, but let's just leave it at that."*

PC\_resident2\_D27

Our interviews revealed that supervisors may experience the power dynamics quite differently than PC /MS residents. Our observations showed that even with a small power distance between residents, the MS resident can easily overrule the PC resident, e.g. by mastery of knowledge. MS residents do not always seem to be aware of the power dynamics at play, while PC residents may be inhibited or silenced by these dynamics. This could be a barrier to intraPC learning, see Box 1.

*"I'm obviously at the top of the hierarchical ladder, so to what extent can someone at the top judge whether hierarchy is a factor. I don't see it as a limiting factor."*

MS\_supervisor\_D23

*"For [PC and MS] residents to go to their MS supervisor: that's a barrier... that certainly has to do with hierarchy."*

MS\_resident\_D33

*Shockroom training (simulation) with MS residents, PC residents, nurses and undergraduate students; teaching was prepared by a couple of a MS resident and a PC resident: It seems that the MS residents mainly educate the others. The atmosphere is relaxed and based on equity. After the simulation, a student asks the PC resident what he would do if this patient showed up in general practice. PC resident does not seem to get a chance to answer this question and is overruled by an MS resident who immediately gives an answer, complemented by another MS resident. A moment later, another intern asks the PC resident why the patient was so agitated in this case. Two MS residents answer this question directly. Again, the PC resident does not seem to get an opportunity to answer for himself, although the question comes directly to him. This hampers the chance of intraPE.*

Fieldnote\_R1\_R2\_H1

*Joint teaching session (12.30): at the start, 1 PC resident, 6 MS residents and 2 undergraduate students attend. They are discussing a patient case. The atmosphere is relaxed and the hierarchy feels rather flat. After 20 min, a supervisor joins the session. Almost immediately after sitting down, the supervisor comments on the case study about symptoms displayed on the screen. This is followed by a discussion between 3 MS residents. At 12.55 two more supervisors join the session. They recognize the patient on the screen and immediately get involved in the discussion. The atmosphere is still relaxed but the hierarchy feels less flat than before the three supervisors joined the group. The supervisors intervene quickly and often in the discussion and take over the lead and the residents become more and more silent, sharing their perspectives less and less.*

FieldnoteR1\_H3

### **Box 1. Two examples of education at the workplace (hospital departments)**

#### **4. Power distribution based on equity impacts fearless learning**

A prevailing view amongst participants is that a certain degree of hierarchical power distribution in the medical workplace can contribute to a constructive manifestation of power dynamics. As long as collaboration is based on equity, hierarchical power distribution could foster a work climate that contributes to fearless intraPC learning during hospital placements. As the following residents said:

*“There is a hierarchy, but everyone can quite easily contact each other. It’s clear who’s ultimately responsible. They’re not vague about it because that would actually hinder a good working atmosphere. That [collaboration] just occurs in a very relaxed way.”*

PC\_resident\_D40

*“We stand above PC residents, but not in rank or anything. It’s more that you’re really above them in terms of knowledge, but not in how you treat each other or whatever... Look, a PC resident may not treat a neurotrauma, that’s a difference of course. It doesn’t make me feel better or higher.”*

MS\_resident\_D7

Our observations and interviews suggest that equity can be promoted by sharing a physical space in which everybody literally stands or sits at the same level during patient discussions.

*“Previously, we were hierarchically separated in the handover room, but we made a conscious decision to have everyone on the same level during the handover, just to be able to discuss everything face-to-face with each other.”*

MS\_supervisor1\_D5

*“I think that’s also one of the reasons that the day-start is always done standing up, so that everyone is equal.”*

PC\_resident2\_D35

## **5. Interaction style impact fearless learning**

Participants indicated that open interactions enable fearless intraPC learning because residents and supervisors feel the bravery to speak up in open interactions. Some supervisors noted, therefore, that they are attentive to asking open questions (collaboration, inviting):

*“Then [asking open-ended questions] you get much more discussion, much more. It’s also much safer... That’s why we pay so much attention to it. And when the department head is a bit adamant, that’s annoying. Then it’s done, and everyone keeps quiet. Yes, that kills the discussion and decreases the [intraPC] learning effect... We know by now how big the consequences are, so we’re very careful about that.”*

MS\_supervisor\_D1

*The handover room is an uncluttered area with three posters on the wall. One poster lists conversation rules:*

*Handover discussion rules:*

- Let each other talk and listen to each other's arguments*
- Be open to each other's opinions*
- Remain rational and fight arguments based on content*
- Discuss on the basis of equality*

*The posters are there as a reminder, and it is noticeable that people comply with these rules, as can be seen in the interaction below:*

*Three supervisors discuss the admission of a patient to Medium Care (MC), and this patient is bedridden and may need to be admitted to a nursing home with more care. A PC resident joins the discussion non-verbally (nodding, shaking, frowning etc.) before saying: "This is a fragile patient who can't make decisions for herself; she has no overview and was already bedridden before admission. Maybe it's my PC perspective, but I'd say: where's the gain in this [admission to MC]? You're not going to do all that, are you?" Supervisor 3 says "This is indeed a cascade, and I recommend consulting the general practitioner first. MC is not a meaningful option: it has no medical benefits, and so we should indeed not suggest that." With input from the PC resident, the plan was adjusted from MC to consultation (intraPC) with general practitioner.*

**Fieldnote\_R1\_H2**

## **Box 2. Handover based on open interaction at the geriatrics department**

Participants mentioned that MS supervisors can play an important role in managing power dynamics and creating a safe work-climate for intraPC learning. To promote fearless learning, some supervisors indicated that they have made policy changes to create a speak-up culture. One supervisor gave an example of an active policy against unconstructive impact of power dynamics at their department:

*"We have a very clear speak up-culture in our department. That has grown over the last years. Everyone treats each other with respect. We find that extremely important. If you don't, you're really put back in your place here. And that goes for both residents and bosses. To cite an example, two years ago, a colleague [MS] was barking at a resident in the hallway. And the emergency room doctor here told him, 'You'll never do that again, or I'll have you fired on the spot.'... There should be no threshold for consultation."*

MS\_supervisor1\_D5

Another way to promote fearless intraPC learning in the hospital ward is to start the workday or team-meeting with a personal briefing or by registering a smiley face that reflects the person's mood. Participants indicated that sharing thoughts, feelings and learning goals could support the connection between teammembers and balance power dynamics.

*“Yes, we consciously chose this [as a start to team-meetings] because studies have shown that employees feel more valued and you also get better team bonding when you first pay attention to whether everyone is fit and if there’s anything we need to take into account.”*

MS\_supervisor1\_D42

## DISCUSSION

Many calls have been made in previous studies to examine and address the influence of power on intraprofessional learning<sup>25,26,45</sup>. To our knowledge, this is the first study specifically investigating power dynamics and their impact on intraPC learning between PC and MS residents during hospital placements. Our data showed five themes that describe characteristics of power dynamics: A. Beliefs; B. Power distribution; C. Interaction style; D. Subjection; E. Fearless learning. These themes were found to be interrelated, and power dynamics among residents and/or supervisors occur both within and between the themes. We report five main types of power dynamics in intraPC learning between PC and MS residents in hospitals: 1) beliefs impact power distribution; 2) beliefs impact interaction style; 3) power distribution based on inequity impact subjection; 4) power distribution based on equity impact fearless learning; 5) interaction style impact fearless learning.

### Beliefs and interaction

Our data suggest that beliefs feed into power and into the way professionals talk about and with each other, and that the nature of the interaction, conversely, create/sustain beliefs, both at the individual and the group level. Our findings are in line with previous studies in other fields, such as organizational psychology and neuroscience, showing that all types of interactions have emotional subtexts<sup>56</sup> and are contagious,<sup>50-54,56</sup> a form of social influence in which individuals directly alter each other’s brain activity,<sup>50,56</sup> attitudes, cognitions, emotions and behaviors.<sup>51,52,55,56</sup>

Such contagion has a profound effect on power dynamics, collaboration quality<sup>52</sup> and team outcomes.<sup>50,51</sup> We found that expressing negative beliefs and attitudes about another profession could lead to an unconstructive manifestation of power dynamics that negatively impact intraPC learning. At the same time, our data indicate that changing the form of interactions by consistently applying conversation rules or other regulations could already have a transformative effect on intraPC (learning) in hospitals as it opens the door to candid discussions. Prior studies demonstrate that the contagiousness of positive interactions, based on curiosity, trust, dignity and confidence,<sup>50,56,57</sup> can lead to better collaboration,<sup>50,52</sup> better learning<sup>50</sup> and fewer conflicts.<sup>53</sup> A powerful first step in changing the impact of power dynamics is to change how we talk. This stresses the

importance of residents and supervisors being aware of their attitudes and beliefs and the way they express themselves, and recognizing which type of interaction encourages intraPC (learning), making the implicit explicit.

### **Interaction style and fearless learning**

This study indicates that a constructive manifestation of power dynamics can occur when hierarchical power distribution is combined with open interactions and collaboration based on equity. This is consistent with prior research revealing an inextricable link between open interactions and psychological safety.<sup>42</sup> In contrast, we found that a lack of equity and open interactions, e.g., when PC residents feel that their voices do not count or are overruled, can lead to their ceasing engagement or subjection, which is detrimental as sharing perspectives and speaking up are essential for intraPC learning. If open interactions were to be applied as merely a technical skill without really being prepared for discussion, the underlying biases and attitudes will still create power dynamics.

While PC residents may be obstructed by power dynamics, our study shows that supervisors and MS residents are not always aware of the impact of these dynamics being at play. Even with the power distance between residents being small, MS residents could easily and unintentionally overpower PC residents. One possible explanation for this is the interrelation between hierarchical status and perceived psychological safety<sup>7</sup>: higher-status MS residents appear to feel safer and hence more comfortable speaking up<sup>36</sup> than lower-status PC residents.

A powerful way to foster psychological safety and fearless learning is by acknowledging each other's opinion,<sup>55,58</sup> by sharing mutual attention<sup>56</sup> and by actively reducing inequity.<sup>36,55</sup> This study yields practical suggestions on how this can be done between PC and MS residents and supervisors: purposefully inviting each other to participate in discussions, asking open-ended questions, being open to other perspectives and criticism, having a functional distribution of power roles combined with consultation based on equity and consistently sharing thoughts and feelings in a personal briefing during team-meetings.

### **Fearless learning in action**

As healthcare and residency training have a strongly hierarchical nature with associated strong professional norms,<sup>5,7,59,60</sup> sustaining fearless intraPC learning on the hospital ward could be easier said than done<sup>60</sup>. Previous studies suggested the need for a profound cultural change to enforce psychological safety and fearless learning,<sup>42,61</sup> the need for identifying specific supervisor behaviors that can minimize power dynamics, and the need for shaping interventions and organizational changes that will cultivate fearless learning among residents<sup>7,8,60</sup> on the hospital ward. This study, however, indicated that effective change could already be achieved by smaller interventions that are quite easy

to implement. Participants noted that supervisors can play an important role in managing power dynamics for the purpose of fearless intraPC learning and participants mentioned various policy changes to balance power dynamics and to support fearless intraPC learning (see implications for practice).

### **Implications for practice**

To manage power dynamics and to facilitate fearless intraPC learning between residents in hospitals, the following ideas might be helpful: i) Invite each other purposefully into discussions and be attentive to listening and asking open-ended questions as a team. Put a poster on the wall with clear conversation rules and (if necessary) consistently remind each other of these agreements during team meetings; ii) Implement an active policy of treating everyone with respect and counteracting unequal power dynamics. Talk to each other about disruptive behavior; iii) Share physical spaces in which people literally stand or sit at the same level during team meetings; iv) Start workdays or meetings with a personal briefing or have staff register emotions by selecting a smiley face that reflects someone's mood; v) Be aware of the beliefs and the way residents and supervisors talk with and about each other and recognize which type of interaction encourages intraPC (learning), making the implicit explicit; vi) Distribute power roles and responsibilities functionally and collaborate on the basis of equity.

Representing the residents' and supervisors' perspective is important for understanding the influence of power dynamics on intraPC learning between residents in hospitals, and it becomes crucial when the goal is to balance these power dynamics in order to foster fearless intraPC learning. This study describes a phenomenon that is often more implicit than explicit, however, this study also demonstrates that not all beliefs, biases and practices are "hidden"; some are perceptible, taken for granted and part of the traditional culture passed down to the next generation. Collaboration during postgraduate training sets the tone for quality of future intraPC. IntraPC learning goes beyond learning new skills and empowering residents, it is a matter of creating a culture of sincere equal collaboration. A deeper understanding of power dynamics and their impact could be useful to open the door to culture change and to further improve intraprofessional collaboration.

### **Limitations**

We recognize that there may be more types of interactions between the themes, for example between beliefs and fearless learning or between interaction style plus power distribution that may promote subjection, but these did not emerge from our study. Some interviewees were very open about power struggles, while others were holding back. As this research was part of a larger project which had a broader scope than power dynamics alone, we may have missed depth or an opportunity to break through interviewees'

hesitations. As the analysis shows data saturation, however, we feel confident about our results.

Triangulation with observations, moreover, helped to gain insight into who were holding back and to get ideas about why this might be the case or what was actually happening in the workplace. Still, it is important to remember that power is a taboo subject, and it may have been difficult for interviewees to really speak up.

### **Future research**

Further research is needed to determine whether and how the listed implications for practice will help to improve fearless intraPC learning. Future studies could focus on using a phenomenological approach in the interviews to really understand the interviewees' perspective. As the topic of power dynamics remains a taboo subject, we recommend focusing on trust before the interview and including metaphors to get an idea of actual beliefs. Based on our experience, we recommend triangulation with observations, because this could be helpful in understanding whatever is not mentioned in interviews.

### **Conclusion**

Power dynamics have an impact on intraPC learning between residents in hospitals. Power distribution between PC residents, MS residents and MS supervisors seems to be an attribution affected by underlying beliefs about professional norms or about other professions. Beliefs influence the way PC residents, MS residents and supervisors interact. Power distribution based on inequity could cause PC residents to be subjected, and power distribution based on equity could lead to fearless learning. Open interactions enable interconnection and fearless intraPC learning. We conclude that the manifestation of power dynamics could be constructive for intraPC learning during hospital placements if power distribution is based on equity, combined with sincere open interactions, actively inviting each other into discussions and enlisting the support of MS supervisors to foster fearless intraPC learning. This can be achieved by creating awareness of implicit beliefs and by making them explicit, recognizing interaction that encourages intraPC learning and creating policies that support fearless intraPC learning.



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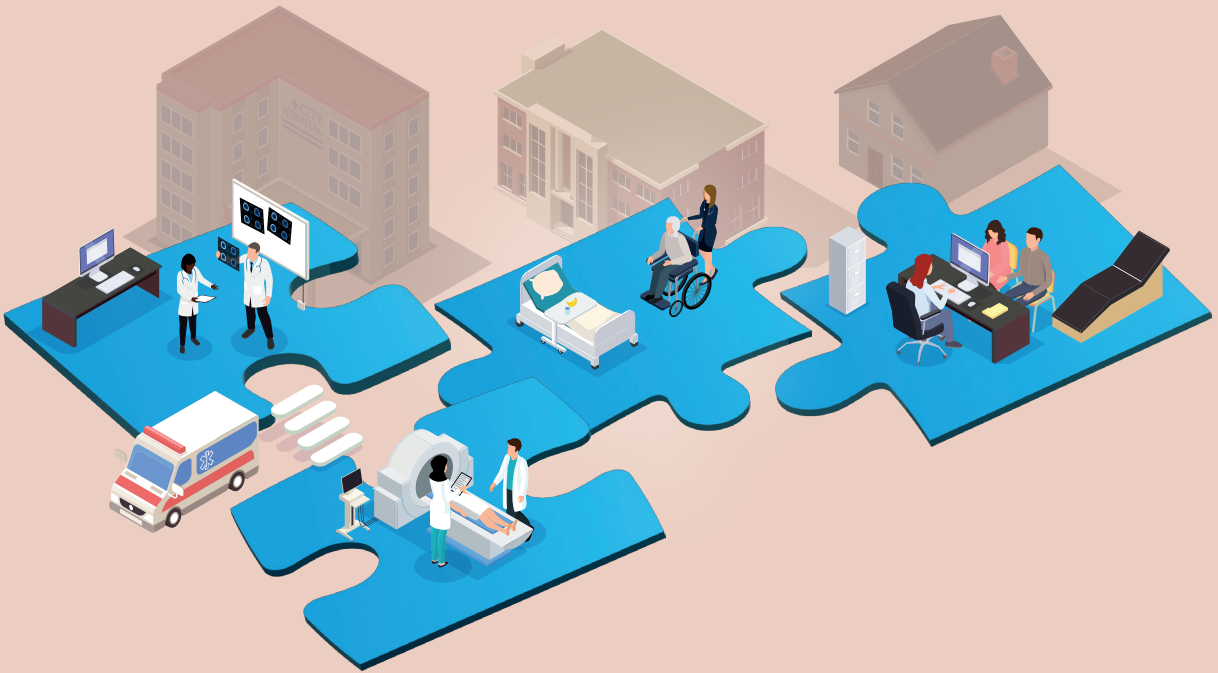




*“The whole is  
greater,  
than the sum of  
its parts”*

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**Aristotele**





# CHAPTER 5

## Adaptability and learning intraprofessional collaboration of residents during the COVID-19 pandemic

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Submitted

# ABSTRACT

## Context

The COVID-19 pandemic created a worldwide public health emergency, in which hospitals created new COVID departments and doctors from different disciplines had to work together. In the Netherlands, a large proportion of doctors in these departments were residents. With knowledge of the disease developing only gradually, the influx of COVID-19 patients called for adaptability, innovative work behavior, and intraprofessional collaboration (intraPC) between residents and between residents and medical specialists.

Research goal: This study investigates how the delivery of COVID-19 care in hospital settings affected the adaptability and learning intraPC of residents.

## Methods

Sixteen semi-structured interviews were conducted with residents and medical specialists from various disciplines who worked at a COVID department or Intensive Care Unit (ICU) during the COVID pandemic in the Netherlands, focusing on adaptability and intraPC learning. Data was analyzed using template analysis.

## Results

We identified four themes that influenced learning during COVID care: collective uncertainty, social cohesion and a sense of safety, the need for adaptive performance and intraPC learning. During the first wave, collective uncertainty about the unknown disease and the continuation of the crisis urged residents to adapt in order to take care of patients with a disease that was as yet unknown. The combination of collective uncertainty, social cohesion and a sense of safety, and the presence of different disciplines in one department promoted residents' intraPC learning. However, intraPC learning was not always the matter of course due to the scope of the crisis and the huge numbers of new patients.

## Conclusion

Collective uncertainty affected the residents' adaptability. The combination of collective uncertainty, social cohesion, and the presence of different disciplines in one department promoted the residents' intraPC learning. An important facilitating factor for both adaptability and intraPC learning is a high level of social cohesion and safety. The physical and psychological proximity of supervisors is an important factor contributing to a safe learning environment.

## BACKGROUND

When the COVID-19 pandemic created a worldwide public health emergency [1, 2] an enormous influx of extremely ill patients with an unknown disease urged hospitals to suspend plannable care and create new COVID departments. In order to cope with and care for patients with an unknown disease, many doctors from different disciplines had to work together in unknown workflows, with unknown colleagues, and sometimes in new roles. As worldwide knowledge of the coronavirus disease developed only gradually, this required medical professionals to show adaptability and innovative work behavior, for example, in revising existing protocols and creating new ones and in collaborating with doctors from other disciplines. The COVID-19 pandemic thus accelerated the need for doctors to adapt and collaborate in a complex, rapidly changing situation [3].

To adapt to new circumstances, doctors should acquire, integrate, and develop new knowledge and skills in order to solve new problems in their daily work practice while maintaining or improving quality of care [4-7]. This ability is called adaptive expertise or adaptive performance [8, 9]. Professionals with high levels of adaptability demonstrate flexible, innovative, and creative competencies in the domain in which they work [8, 10]. This flexible work behavior helps them adapt to change [11]. The adaptability of professionals is influenced by factors at three different levels: 1) learner/practitioner characteristics, e.g., domain-specific knowledge, skills, regulation processes, and past experiences [9]; 2) task characteristics, e.g., complexity, autonomy, and error-learning [9]; and 3) group/team and organizational characteristics, e.g., support from colleagues, supervisors, and the organization, team learning, and innovation climate [11].

Adaptability alone, however, is not sufficient to guarantee quality of healthcare: it is impossible for doctors to provide comprehensive care as a single professional [12, 13], and particularly during a pandemic, good collaboration among doctors is necessary for them to be able to handle the complexity of care [12, 13]. During the COVID pandemic, doctors from different disciplines were collaborating, which is called *intraprofessional* collaboration (intraPC) [13]. In the Netherlands, a large proportion of doctors working in COVID departments were residents.

Adaptability and intraPC are not only important during a pandemic, but they are essential competencies for (future) doctors as, with increasing numbers of patients with multimorbidity and rising diagnostic and therapeutic possibilities, the complexity of care is always on the rise [5]. Medical schools, therefore, are trying to find ways to teach their residents adaptability and intraPC skills [9, 12]. See also Box 1.

During the COVID-19 pandemic, residents and doctors not in training (both referred to as 'residents' henceforth) in the Netherlands often worked at COVID or Intensive Care Unit (ICU) departments. The aim of this study is to gain insight into the adaptability and intraPC workplace learning of residents during the COVID-19 pandemic in the Netherlands. Our intention here is to learn lessons for the development of adaptive expertise and intraPC learning in postgraduate training in non-crisis settings.

In the Netherlands, medical graduates can continue their careers in medicine in different ways [14]. Most of them apply for a job as 'doctor not in training' or apply for a medical residency program. In the position of a 'doctor not in training' they work as doctors under supervision of a medical specialist but do not receive education as part of a training program. When admitted to a medical residency program, they become 'doctors in training' and they will be trained to become medical specialists. Their primary way of learning is Workplace Learning (WPL) [14, 15].

**Box 1** *Explanation of career paths as graduated doctors*

## METHODS

We carried out a qualitative study using semi-structured, in-depth interviews from March 2020 up until April 2021. Within this time-span, the COVID-19 pandemic showed three waves in which a large number of patients were admitted to hospital care.

### Context

During the first wave of the pandemic in the Netherlands, plannable care was suspended to deal with the massive influx of COVID patients, with the result that Dutch hospitals consisted chiefly of COVID and ICU -departments at that time. These departments were primarily supervised by medical specialists from disciplines related to COVID care (e.g., internist). These supervisors supervised both residents and medical specialists from disciplines unrelated to COVID care (e.g., gynecologists) that also worked at the COVID and ICU departments. In this article, we will refer to this last group of medical specialists as "guest doctors".

### Reflexivity and ethical approval

Using an interpretivist research paradigm [16], we focused on understanding multiple and diverse interpretations of reality. This perspective makes it especially important to pay attention to reflexivity throughout the research process [17], which we did by questioning how our assumptions and perspectives had shaped our data collection, analysis, and interpretation during monthly meetings with all members of the research team. The multidisciplinary research team was valuable during these discussions, as it

provided an opportunity to triangulate knowledge and expertise from different professional backgrounds: educational science (LB, CF, WK, MB, MvdH), psychology (RvdG, NL), and medicine (NS, JdG).

The ethical review board of the Dutch Organization of Medical Education (NVMO) approved the study under NERB number 2020.4.4.

## **Respondents**

Fitting an interpretivist research paradigm [16], we chose a multi-perspective view on the learning of residents [17]. Therefore, we were interested not only in the perspectives of residents, but also in those of supervisors and guest doctors from several disciplines, in order to generate richer data with respect to the adaptability and intraPC learning of residents during COVID care.

Through the Dutch Association of Medical specialists and the Junior Specialists Association, one of the authors (MB), who works as an educational scientist for the Federation Medical Specialists (FMS), obtained an overview of doctors who had given their verbal consent to be approached for research purposes. These doctors worked at a COVID or ICU department in the Netherlands. This list was used for purposive sampling, in order to recruit a diversity of residents and supervisors in different positions and disciplines and working in different hospitals [18]. An information letter and an informed consent form were sent by email to potential respondents by one of the researchers (LB or RvdG). After we had included our first respondents, we used snowballing techniques to further diversify our sample of respondents. Data collection was completed when the research group concluded that they had reached meaning saturation to answer the research questions [19].

## **Data collection**

We conducted semi-structured interviews. A preliminary interview guide, designed by the research group based on literature, was piloted by two researchers (LB and NL) and adjusted afterwards (see Additional file 1 for the final interview guide used). As we were pursuing data saturation of respondents' perspectives about a similar experience, we decided to focus primarily on respondents' experiences of the first wave in all interviews. In addition, we asked respondents who provided care in the first and second waves about differences between both waves.

Two researchers (LB and RvdG) performed the interviews as a duo. Due to the COVID measures in place at the time, the interviews were conducted in an online (secured) environment. Each respondent signed the informed consent form prior to the interview. None of the respondents was compensated for their participation. All interviews were

audio-recorded and later transcribed. Names and other personal data were not transferred to these transcripts.

### **Data analysis**

Transcripts of the interviews were analyzed using template analysis [20]. This method fitted our research question because it allowed us to combine a solid theoretical foundation with interpretations that were identified from the data. Based on the research question and the literature, four codes were determined a priori: adaptability, intraPC learning, individual factors, and context factors. The initial template was further developed through coding of the first transcripts by LB and RvdG and discussions with the research group. After this, the coding process continued iteratively, with the template being adjusted if this was deemed necessary based on the discussions. LB and RvdG both first coded the transcripts independently and subsequently discussed them together. After all transcripts had been coded, a final coding template was established through discussion within the research team.

## **RESULTS**

We conducted sixteen interviews (25-50 minutes per interview) from November 2020 to May 2021 with nine residents, five supervisors, and two guest doctors (Table 1). Respondents worked at nine hospitals all over the Netherlands.

After coding the results, we identified four themes that influenced learning during COVID care: i) collective uncertainty, ii) social cohesion and a sense of safety, iii) the need for adaptive performance and iv) intraPC learning (see Additional file 2 for the final coding template).

### **Collective uncertainty**

The outbreak of the pandemic was very sudden. Within a very short time span, hospitals had to rearrange their care systems to take care of the massive influx of patients with an unknown disease and with knowledge and treatment developing only slowly. As a result, many changes in schedules, working hours, and locations took place in a short period of time. Residents mentioned that uncertainty about these preconditions was one of the most stressful aspects of their work during the pandemic. Due to the sudden, massive outbreak of an unknown disease, no one knew exactly what to expect and what needed to be done to deal with the crisis. Residents said this was the first time their supervisors and other medical specialists could not answer all their questions.

Respondent	Position	Original discipline	Academic (A) vs. non-academic (nA) hospital
1	Resident (not in training)	Emergency	A
2	Resident (not in training)	Internal medicine	A
3	Resident (not in training)	Internal medicine	nA
4	Resident (not in training)	Surgery	nA
5	Resident	Sports medicine	nA
6	Resident	Geriatrics	nA
7	Resident	Internal medicine	nA
8	Resident	Cardiology	nA
9	Resident	Cardiology	nA
10	Supervisor	Internal medicine	A
11	Supervisor	Sports medicine	nA
12	Supervisor	Anesthesiology	nA
13	Supervisor	Internal medicine	nA
14	Supervisor	Geriatrics	nA
15	Guest doctor	Anesthesiology	A
16	Guest doctor	Cardiology	nA

**Table 1.** Description of the respondents

*“That bit of security, that there is always my supervisor, my back-up, who will know if I don’t know, that dropped away to some extent.” (R7, resident)*

This collective uncertainty led to a change in roles and hierarchies. Respondents described situations in which a resident had more COVID knowledge than his/her supervisor. Related to this were changes in the decision-making process: everyone’s input was taken into account, and as nobody knew the right course of action all ideas were taken into consideration. Respondents also mentioned that, as they were under great pressure to act, they learned to make decisions more quickly than usual. Due to these changes in dynamics, residents were now involved in (management) processes that were usually carried out by medical specialists only.

*“It didn’t matter much anymore whether that literature was put forward by a resident or a staff member [...], but you did take each other seriously because neither of you really knew that much about the matter. It was all discussed very quickly.” (R12, supervisor).*

### **Social cohesion and a sense of safety**

Respondents described that they experienced a pleasant working atmosphere and a great sense of team spirit in the COVID and ICU departments during the first wave. This was evident in the distribution of tasks and the allocation of patients amongst doctors, which appeared to be taking place in a more organic fashion than in times of non-crisis. A high level of social cohesion was the evident result of working together under pressure with one common goal: providing the best possible care for COVID patients.

Furthermore, residents mentioned that they experienced a safe learning climate while providing COVID care. Several changes in the way supervision was organized appeared to be related to their experience of safety. First, supervisors were physically more present than in the usual non-crisis situation. Second, supervisors explicitly mentioned that they were available for questions. Third, residents observed that, with supervisors admitting that they also felt insecure about how to deal with COVID patients, they showed themselves to be vulnerable. Residents indicated that they felt more comfortable asking any question as no one knew the answer, which was articulated by all doctors. In non-crisis situations, residents feel inhibited by the idea that supervisors will judge their level of knowledge based on the questions they ask. During the pandemic, it made sense that even supervisors had no knowledge of the disease, and residents, therefore, dared to ask anything they wanted to know.

*“So it was just said out loud by everyone: ‘Yes guys, this is a weird situation [...], and we [medical specialists] don’t know what’s the matter with all these people either. But we’ve heard about this, so let’s give it a shot.’ That really helped me a lot.” (R7, resident)*

### **The need for adaptive performance**

As COVID was an unknown disease, there were as yet no guidelines and protocols regarding COVID care. Respondents mentioned that the lack of guidelines and protocols urged them to develop and implement these themselves, involving them, unlike before the crisis, in policy development. Another way in which the respondents’ adaptive performance was stimulated, was by their actively creating an overview to keep the situation manageable.

*“I made guidelines, went through the procedure with the nurses, made a notice board for the hallway with the important phone numbers and who does what where, and listing the medication that we still gave at the time.” (R6, resident)*

Residents attributed their ability to adapt to the new situation to various aspects: previous work experience, clinical reasoning skills, personality, and the social cohesion that prevailed during the pandemic. Being able to adapt allowed them to deal with the



uncertainties that came with the pandemic. It was valuable for them to realize that they could manage their work during a crisis situation, which boosted their self-confidence and benefited their professional development.

“So many things I was dealing with. At first, it was just like ‘Wow, I’m really doing this!’”. (R6, resident)

COVID care specifically accelerated the need for developing new knowledge and skills, thus developing a flexible attitude from all doctors. Supervisors explained that residents need a flexible attitude even in non-crisis situations because they often encounter new situations.

*“I think that, because of their age, residents aren’t that stuck in their ways yet, and so they find it a lot easier to step out of their comfort zone. In a sense, they’re always out of their comfort zone, as they’re still learning. They’re new to the hospital, and so they’re used to dealing with new things all the time.”* (R13, supervisor)

Some residents indicated that they had explicitly learned to set their own boundaries and that their career choice had been confirmed by working as a doctor at a COVID or ICU department during the crisis. They also noted that once they had become familiar with the disease and its methods and protocols, the work itself was relatively easy, and routines developed quickly. Some residents, therefore, worried that working in COVID care for a long period of time would limit their possibilities for learning.

*“I am a bit afraid that I didn’t acquire as much medical knowledge as I should have at that point in my training program [...]. I saw so many [COVID patients], your learning curve does end at some point. I just missed a lot of training moments for dealing with other internal patients.”* (R8, resident)

Respondents who worked in ICU or COVID departments during both the first and the second wave mentioned that team dynamics changed after the first wave. Collective uncertainty decreased because more knowledge of COVID-19 and its treatment had become available. When plannable care was gradually taken up again and medical specialists returned to care in their own departments, COVID care was run primarily by residents, with some supervisors as a backstop. This caused the level of social cohesion to decrease.

*“During the second wave, things were very different because the regular care had to continue as well. So then we [residents] were essentially responsible for all COVID care in all the COVID departments that were up and running [...]. The medical specialists were back to their own wards and their routines. So that’s when it stopped being a collective activity.”* (R3, resident)

### **IntraPC learning**

The majority of participants mentioned that the presence of doctors from different disciplines in one department was beneficial for intraPC because this made it easy for them to consult someone with specific expertise. Residents appeared to ask mostly medical questions to their supervisors during (formal) supervision moments; they asked the easier or more practical questions to other residents. In addition, residents indicated that they also collaborated with residents from other disciplines and learned from them by having conversations about their background, expertise, experience, and ideas, which mainly took place during the quieter moments.

*“Because of the different backgrounds, we purposefully asked questions to certain people. And so, as I had worked in an emergency care department for a year, the internal medicine resident approached me sometimes, saying ‘How do you think I should handle this in the emergency room?’ And I said ‘Well, this way and that’. So your background and previous experience were deliberately used.” (R1, resident)*

The interviews revealed that intraPC between residents mainly occurred in specific situations. One internist in-training, for example, explained how she consulted a gynecologist in-training when she encountered a pregnant COVID patient.

Intraprofessional consultations on specific cases, such as a pregnant COVID patient, did take place, but due to lack of time and protective equipment, doctors did not (or no longer) visit patients together. In this regard, some mentioned that guest doctors were more inclined to simply refer their patient to a doctor from an appropriate discipline rather than consult that doctor to broaden their intraprofessional knowledge and ability by taking care of that patient themselves.

Similarly, respondents indicated that guest doctors at the ICU and COVID departments only called upon residents on rare occasions and that the questions they asked were mostly about practicalities, such as “where do I report this in the electronic patient file?”. In this sense, there appeared to be limited reciprocity regarding the exchange of domain-specific knowledge between residents and medical specialists.

*“I asked the anesthesiologists [supervisors] like ‘Well, would you show me how to use an ultrasound when placing an IV. I would like to learn that’. And the other way around it was more like ‘Well, you do it because I don’t know how to’. But not like ‘Diabetes, that’s interesting, can you tell me a little more about it?’ No, there wasn’t really any curiosity like that.” (R7, resident)*

Some characteristics of the COVID situation appeared to impede intraPC learning: the high pressure and pace of COVID care, the reduced opportunities for providing care together and the suspension of joint education sessions. This last characteristic was related to the limited availability of protective equipment and to COVID-related constraints such as the limited presence of doctors on the ward. Some respondents mentioned that they were assigned to patients and got so involved with these patients that they hardly ever spoke to colleagues; they “just did their job”. These respondents explained that they looked up the necessary information themselves or consulted their own network outside the hospital.

*“It was something you did, as you didn’t interact much with the others. We didn’t meet anymore at all. [...] You had to do it yourself as a doctor, to find all the information you needed. There just weren’t any other moments.” (R16, guest-doctor)*

Working in the same department during the COVID crisis appeared to have had a reinforcing effect on post-crisis collaboration. Respondents mentioned that they communicated more easily and openly with colleagues from other disciplines they had met during COVID care, even though they had returned to their own wards.

*“The neurosurgery people, for example, I didn’t know those people at all because you never meet them normally. But at the COVID department I had worked with this guy for four weeks. And now when I call the department and I happen to speak to him on the phone, I just say “Hey [name], how are you?” That makes it so much easier to work together.” (R2, resident).*

## DISCUSSION

This study aimed to gain insight into the adaptive performance and intraPC learning of residents during the COVID-19 pandemic. The first wave of the pandemic was characterized by a collective uncertainty among all doctors involved and a high level of social cohesion and a sense of safety on COVID and ICU wards. The collective uncertainty forced supervisors and residents to adapt as they had to find solutions and create an overview within an unpredictable crisis situation. The experience of being able to adapt to uncertain, changing circumstances appeared to increase the residents’ self-confidence. The combination of collective uncertainty, a high level of social cohesion and a sense of safety, and the presence of doctors from different disciplines within COVID departments also promoted residents’ intraPC learning. Though this was not always the matter of course: due to the scope of the crisis and the huge numbers of new patients, it was sometimes difficult to collaborate with other doctors and learn from them.

Our study showed that the urgency of caring for extremely ill patients with an unknown disease created collective uncertainty and prompted supervisors and residents to adapt. This is in line with prior studies which have shown that adaptability is characterized by coping with stressful situations or emergencies and dealing with uncertainty and changing circumstances [21, 22]. In the first wave, residents working on COVID or ICU departments faced stressful, uncertain circumstances and provided care to large numbers of COVID patients within a limited time span. This turned out to be conducive to their learning process. The residents' adaptive expertise appeared to be particularly stimulated by their growing domain-specific knowledge of COVID-19, the task complexity involved in COVID care, and their working with supportive colleagues who stimulated team learning, which is in line with earlier studies [9, 11].

In the subsequent waves, more knowledge of how to manage the disease had become available, and working practices had been laid down into protocols. After the first wave, therefore, doctors worked in COVID care with increasing efficiency, turning COVID care into a routine task. Working towards mastering COVID care by performing all necessary actions to the best of their ability and becoming "routine experts in covid care" appears to be beneficial for residents in the short term because this pushes them to perform with the greatest efficiency and effectiveness. In the longer term, however, when the innovation dimension was excluded or undervalued, opportunities for developing adaptive expertise reduced [9]. In addition, our results showed that, after the first wave, the large flow of patients and especially the performance of what had now become routine tasks appears to have led to a decreased motivation to work in the COVID department and no longer appealed to the adaptability. This supports previous research [23].

The collective uncertainty among first-wave doctors not only promoted adaptability but also contributed to intraPC learning. Previous research has shown that there are many barriers to intraPC learning, such as a high level of hierarchy in the workplace, lack of awareness of intraPC learning opportunities, and unidirectional learning [24, 25]. The presence of different disciplines in one location, therefore, does not necessarily result in intraPC learning [24]. Our research showed, however, that the presence of different disciplines in one COVID /ICU department led to lower thresholds to collaboration and encouraged residents to consult intraprofessional colleagues, both during and after the first wave.

We found two possible explanations for this. One possible explanation is that the combination of collective uncertainty, psychological proximity, and an extraordinary degree of social cohesion during work in the same department in a pandemic crisis stimulates cross-boundary teaming [26]. Our study shows that this creates a strong team spirit, which positively influences interpersonal relationships. IntraPC turned out to have improved after

the pandemic, with respondents reporting that their thresholds for initiating interactions with intraprofessional colleagues, with whom they had worked with in the same COVID / ICU department, decreased once they had returned to their own workplaces. This could foster future intraPC learning.

Another possible explanation could be the occurrence of constructive power dynamics in COVID departments. Power dynamics describe “the way in which power impacts the interaction of two or more people or groups” [25, 27] and can either have an constructive or nonconstructive manifestation and, consequently, a corrosive or conducive effect on intraPC learning [25]. Our study shows that different constructive power dynamics were at work in COVID/ICU departments, such as everyone’s shared lack of knowledge of COVID-19, the distribution of roles and responsibilities based on equity without any inter-discipline supremacy, sincere and equal collaboration, and everyone’s accessibility for consultation. Positive power dynamics are a major contributor to a culture of sincere equal intraPC. However, our research also showed that intraPC learning could be limited by the high workload and various practical limitations.

Most COVID /ICU departments in the first wave were considered a safe psychological working and learning environment, which promoted both the adaptability and the intraPC learning of residents. Previous research already showed that a supportive learning climate affects learners’ motivation, self-confidence, and overall moral and academic achievements [28-30]. Our study shows that the perceived psychological safety was facilitated by the proximity of supervisors in two ways: physical proximity and, more importantly, psychological proximity. Physical proximity occurred because most supervisors were available on site rather than on call, and psychological proximity occurred because supervisors repeatedly instructed residents to approach them with questions and were explicitly transparent about their own clinical uncertainty regarding COVID patient cases.

Such psychological proximity bridges the hierarchical gap between residents and supervisors and influences the residents’ perception of clinical uncertainty. Although recognizing and coping with clinical uncertainty is part of the doctors’ job, being able to accept and deal with uncertainty is something many find challenging [31]. Mutual trust and psychological proximity can make it easier for residents to stretch themselves beyond their comfort zone. The pandemic “forced” supervisors to show themselves to be vulnerable by admitting that they were uncertain as well and did not have all the answers. Residents appreciated this vulnerability, as it confirmed to them that it was okay to feel uncertain and to ask questions. Prior research confirms that supervisors’ willingness to engage collegially with residents and disclose their own vulnerabilities leads to enhanced mutual trust, which fosters learning [32]. As most postgraduate training programs consist of short rotations, in which opportunities for developing supervisor-trainee trust relations

are scarce, it is recommended to explore ways to foster a culture of trust [32]. Our study provides a valuable complement by providing implications for practice, based on learning during COVID, for learning during postgraduate training in non-crisis settings.

### **Implications for practice**

In facilitating the enhancement of adaptability and intraPC learning during postgraduate training, we believe the following ideas might be helpful.

First, create a safe learning environment by investing in social cohesion and team spirit, being easily approachable to other disciplines, and responding respectfully to questions. Show the human factor and stimulate the dialogue.

Second, create a culture in which everyone can express themselves freely and in which supervisors can express clinical uncertainty, for example, by being transparent, open, vulnerable, and honest.

Third, deliberately apply two modes of supervisor proximity: physical proximity and psychological proximity. Be close and accessible to residents as a supervisor. Listen to their questions and also encourage them to find their own solutions, perhaps with their intraprofessional colleagues.

Fourth, proactively change perspectives. Put yourself in the shoes of another discipline or role by switching positions (your discipline and another one, or as a resident and as a supervisor) and experience and learn from each other's perspective by working in each other's role.

Fifth, learn from uncertainty. Train your flexibility and adaptability, by doing new things, by simulating situations with many uncertainties in which supervisors and residents learn together in situations where protocols and guidelines could not be applied, or by participating in parts of the care process with which you are unfamiliar.

### **Strengths and limitations**

A strength of this study is its three types of triangulation: a) data source triangulation: triangulation in perspectives on the residents' learning was established by interviewing residents, supervisors, and guest doctors; b) investigator triangulation: all interviews and the coding process were performed by two researchers, thus combining two perspectives to generate a thorough analysis; and c) research group triangulation: our research was conducted in a multidisciplinary team, with the different professional knowledge domains and backgrounds operating as a form of triangulation [17].

A limitation of our research might be the time gap between when care was provided during the pandemic and when the interviews were held: some respondents were interviewed in December 2020, while the first COVID wave started in March and ended in May 2020. This may have resulted in recall bias and incomplete respondents' stories. The scale of the pandemic, however, made it impossible to conduct interviews earlier on.

## **Conclusions**

Collective uncertainty affects the adaptability of residents. The combination of collective uncertainty, social cohesion, and the presence of different disciplines in one department can promote residents' intraPC learning. An important facilitating factor for both adaptability and intraPC learning is a high level of social cohesion and safety, as this was experienced during first COVID care wave. The physical and psychological proximity of supervisors is an important factor contributing to a safe learning environment.

## **List of abbreviations**

IntraPC: intraprofessional collaboration

ICU: Intensive Care Unit

WPL: Workplace Learning

## **Declarations**

### ***Ethics approval and consent to participate***

The ethical review board of the Dutch Organization of Medical Education (NVMO) approved the study under NERB number 2020.4.4. Written and verbal informed consent was obtained from all participants.

### ***Availability of data and materials***

All data generated or analyzed during this study are included in this published article. The data that support the findings of this study are available from the corresponding author upon reasonable request.

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This study was partly funded by the Dutch Federation of Medical Specialists (FMS). One of the authors, MB, works as an educational scientist for the FMS. MB only obtained an overview of the research group of doctors who gave their verbal consent to be approached for research purposes. FMS did not play a role in the design of the study, nor did they play a role in the collection, analysis and interpretation of data and the writing of the manuscript.

### ***Authors' contributions***

LB, NL, CF, MvdH, WK and NS contributed to the design of the study. LB and RvdG contributed to the acquisition of data, WK and NL contributed to the daily supervising

in subsequent stages of the research and all authors contributed to the analysis and/or interpretation of the data and have drafted the work. All authors have approved the submitted version and have agreed both to be personally accountable for the author's own contributions and to ensure that questions relating to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

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## ADDITIONAL FILE INTERVIEW GUIDES

### Interview Guide for Residents

Categories	Primary questions	(Possible) supplementary questions
<b>Introduction</b>	<p>Would you introduce yourself?</p> <ul style="list-style-type: none"> <li>- Which residency program are you taking?</li> <li>- What is your work experience?</li> </ul> <p>Can you tell us about your activities at the COVID/ICU department from March 2020 onwards?</p>	<ul style="list-style-type: none"> <li>• What else did you experience?</li> </ul> <p><i>Alternatives</i></p> <ul style="list-style-type: none"> <li>• You mentioned [...], could you clarify that?</li> <li>• Can you give an example of that?</li> </ul>
<b>Individual development and adaptability</b>	<p>How did your activities in the COVID/ICU department influence your professional development?</p> <p>Were there things that you needed to do differently than in the normal situation? If so, what was different?</p> <ul style="list-style-type: none"> <li>- How did you deal with these differences?</li> <li>- Did you come up with new activities or solutions yourself?</li> </ul> <p>Who or what was helpful when performing things differently?</p> <p>Who or what was hindering when performing things differently?</p> <p>Were there any times when you were surprised by your own activities?</p> <p>What were the supervision arrangements?</p> <p>In sum: what was helpful for developing expertise during the first wave? And what was hindering?</p>	<ul style="list-style-type: none"> <li>• What kind of knowledge/skills/abilities were required from residents?</li> <li>• Did you have any previous experience with radical change or unpredictable situation? If so, did these experiences help you in the current situation?</li> <li>• Did you come up with things yourself, or were you not allowed to do so?</li> </ul> <p><i>Alternatives:</i></p> <ul style="list-style-type: none"> <li>• You mentioned [...], could you clarify that?</li> <li>• Can you give an example of that?</li> <li>• What was enabling?</li> <li>• What was hindering?</li> <li>• Do I understand correctly that ...?</li> <li>• It is important to you that ...?</li> </ul>

Categories	Primary questions	(Possible) supplementary questions
<b>IntraPC learning</b>	<p>Can you tell us about collaboration with colleagues during COVID care?            What did you like or dislike about this?            Did you experience any differences in collaborating with different colleagues?            - Differences between disciplines?            - Differences between residents/supervisors/guest doctors?            - Differences with the normal situation?</p> <p>What did you learn from collaborating with colleagues from different disciplines?            - Did colleagues challenge you to perform differently and/or learn new things?            - Did you challenge colleagues to perform differently and/or learn new things?</p> <p>Who or what was helpful during collaboration with colleagues?</p> <p>Who or what was hindering during collaboration with colleagues?</p>	<ul style="list-style-type: none"> <li>• To what extent do you recognize these intraPC activities from the normal situation?</li> <li>• Did the crisis influence the degree of connection with colleagues?</li> <li>• Did the crisis impact your outlook on learning and/or collaboration?</li> </ul> <p><i>Alternatives</i></p> <ul style="list-style-type: none"> <li>• Do you have similar experiences in your collaboration with other disciplines?</li> <li>• You mentioned [...], can you clarify that?</li> <li>• Do you have an example of that?</li> <li>• What was your contribution?</li> <li>• Why do you think that is important?</li> </ul>
<b>First vs. second wave</b> <i>This category was added in a final version of the interview guide</i>	<p>In previous interviews, we heard that there were differences between the first and second waves. How do you experience this?            - How do you explain these differences?</p>	<ul style="list-style-type: none"> <li>• What is the biggest difference according to you?</li> <li>• Do you have an example of this?</li> </ul>
<b>Future</b>	<p>What lessons could be learned from your experiences during COVID care?</p> <p>How could other residents acquire the same knowledge/skills/abilities when working in regular care?</p>	<p><i>Alternatives</i></p> <ul style="list-style-type: none"> <li>• You mentioned [...], can you clarify that?</li> <li>• Can you give an example of this?</li> <li>• How do you envision this?</li> <li>• Did I understand correctly that ...?</li> </ul>
<b>To conclude</b>	<p>Is there anything that you would like to add or change in response to everything we discussed?</p>	

## Interview Guide for Supervisors and Guest Doctors

Categories	Primary questions	(Possible) supplementary questions
<b>Introduction</b>	<p>Could you introduce yourself?</p> <ul style="list-style-type: none"> <li>- What is your medical specialism?</li> <li>- What is your experience with supervising residents?</li> </ul> <p>What were your tasks and responsibilities with regard to guiding residents? To what extent did this differ from your normal tasks?</p> <p>What were the tasks and responsibilities of residents during COVID care? How did this differ from the regular situation?</p>	<p><i>Alternatives</i></p> <ul style="list-style-type: none"> <li>• You mentioned [...], could you clarify that?</li> <li>• Can you give an example of that?</li> </ul>
<b>Individual development and adaptability of residents</b>	<p>What did you see residents do during the first wave? What was different in this compared to before?</p> <p>Did you see any differences between residents during the first wave? What differences? How did the residents' practices differ from one another?</p> <p>In what ways did residents deal with this new way of working? What do you think this depended on?</p> <p>To what extent did you play a role for the residents in your department during the first wave? What role? Was there a difference between residents from your own discipline and residents from other disciplines?</p> <ul style="list-style-type: none"> <li>- What appeal did these residents in your department make on you (and your fellow supervisors)?</li> </ul> <p>Have you learned anything from residents? What? How did you experience this?</p> <p>Do you think some competencies received more attention during the first wave than before? In case of change, how did this come about?</p> <p>What did this mean for the residents' development and supervision?</p> <p>Are there any competencies that did not get much attention during the first wave and that need to be given more attention now?</p> <p>Have you wondered about something residents did during the first wave? What did they do? How did you experience this?</p>	<ul style="list-style-type: none"> <li>• Why did this happen in this way?</li> <li>• What kind of knowledge/skills/abilities were required from residents?</li> <li>• How did residents deal with these new experiences/practices?</li> <li>• What helped residents?</li> </ul> <p><i>Alternatives:</i></p> <ul style="list-style-type: none"> <li>• You said [...], could you explain that further?</li> <li>• Could you give an example?</li> <li>• What is conducive in this?</li> <li>• What is hindering it?</li> </ul> <p><i>Concluding question:</i></p> <ul style="list-style-type: none"> <li>• Do I understand correctly that...</li> <li>• It is important for you that...?</li> </ul>

Categories	Primary questions	(Possible) supplementary questions
<b>IntraPC learning of residents</b>	<p>How did residents collaborate with other disciplines at your department during the first wave?</p> <p>To what extent did you play a role in collaboration among residents or with other physicians in your department during the first wave? What role? Was there a difference in this between residents from your own discipline and residents from other disciplines?</p> <p>How was the collaboration between you and the residents you supervised during first wave? To what extent was it different from before?</p> <p>What do you think helped residents in collaborating with other physicians during the first wave? Who or what was supportive in this?</p> <p>What do you think was difficult or got in the way for residents in collaborating with other physicians during the first wave? Who or what could have helped them?</p> <p>Did you also learn things from residents in terms of collaborating with physicians from other disciplines during the first wave? If so, what? (How did you experience this?)</p>	<ul style="list-style-type: none"> <li>• Could you tell me more about that?</li> <li>• To what extent do you recognize this during IPC in non-crisis time?</li> <li>• During the crisis, did you experience a difference between collaboration of doctors from different disciplines? What difference?</li> <li>• To what extent did the environment (colleagues, supervisors, physical location, etc.) contribute to the professional development of residents?</li> <li>• Did this differ during crisis than before crisis times? If so, in what way?</li> </ul> <p><i>Alternatives:</i></p> <ul style="list-style-type: none"> <li>• You said [...], could you explain that further?</li> <li>• Could you give an example of that?</li> <li>• What was your role?</li> <li>• Why do you think that is important?</li> </ul> <p><i>Concluding question:</i></p> <ul style="list-style-type: none"> <li>• Do I understand correctly that...</li> <li>• It is important for you that...?</li> </ul>
<b>First vs. second wave</b> <i>This category was added in a final version of the interview guide</i>	<p>In previous interviews we heard that there were differences between the first and second waves. How do you experience this?</p> <p>How do you explain these differences?</p>	<ul style="list-style-type: none"> <li>• What is the biggest difference according to you?</li> <li>• Do you have an example of this?</li> </ul>

Categories	Primary questions	(Possible) supplementary questions
<b>Future</b>	<p>What lessons could be learned from your experience as a supervisor during COVID care?</p> <p>How could other residents acquire the same knowledge/skills/abilities when working in regular care?</p>	<p><i>Alternatives</i></p> <ul style="list-style-type: none"> <li>• You mentioned [...], can you clarify that?</li> <li>• Can you give an example of this?</li> <li>• How do you envision this?</li> <li>• Did I understand correctly that ...?</li> </ul>
<b>To conclude</b>	<p>Is there anything that you would like to add or change in response to everything we discussed?</p>	

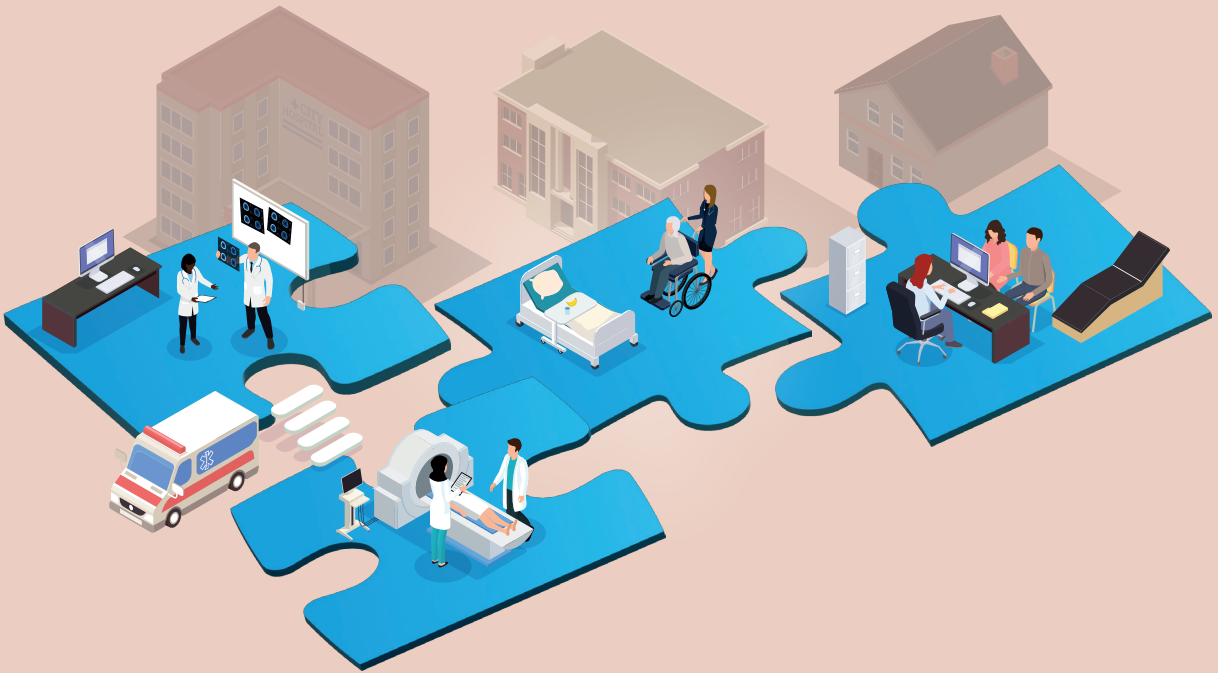




*“To do things  
right,  
first you need  
love,  
then technique”*

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**Antoni Gaudí**



# CHAPTER 6

## Designing the learning of intraprofessional collaboration among medical residents

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# ABSTRACT

## Background

To preserve quality and continuity of care, collaboration between primary-care and secondary-care physicians is becoming increasingly important. Therefore, learning intraprofessional collaboration (intraPC) requires explicit attention during postgraduate training. Hospital placements provide opportunities for intraPC learning, but these opportunities require interventions to support and enhance such learning. Design-Principles guide the design and development of educational activities when theory-driven Design-Principles are tailored into context-sensitive Design-Principles. The aim of this study was to develop and substantiate a set of theory-driven and context-sensitive Design-Principles for intraPC learning during hospital placements.

## Methods

Based on our earlier research, we formulated nine theory-driven Design-Principles. To enrich, refine and consolidate these principles, three focus group sessions with stakeholders were conducted using a Modified Nominal Group Technique. Next, two work conferences were conducted to test the feasibility and applicability of the Design-Principles for developing intraPC educational activities and to sharpen the principles into a final set of Design-Principles.

## Results

The theoretical Design-Principles were discussed and modified iteratively. Two new Design-Principles were added during focus group 1, and one more Design-Principle was added during focus group 2. The Design-Principles were categorized into three clusters: 1) *Culture*: building collaborative relations in a psychologically safe context where patterns or feelings of power dynamics between primary and secondary care physicians can be discussed; 2) *Connecting Contexts*: making residents and supervisors mutually understand each other's work contexts and activities; and 3) *Making the Implicit Explicit*: having supervising teams act as role models demonstrating intraPC and continuously pursuing improvement in intraPC to make intraPC explicit. Participants were unanimous in their view that the Design-Principles in the *Culture* cluster were prerequisites to facilitate intraPC learning.

## Conclusion

This study led to the development of 12 theory-driven and context-sensitive Design-Principles that may guide the design of educational activities to support intraPC learning during hospital placements.

## INTRODUCTION

The increasing number and complexity of patients with multimorbidity results in shifting healthcare system demands.<sup>1-3</sup> Consequently, a growing number of patients needs to be seen by multiple physicians from primary care (e.g., family physicians in the primary care setting) and secondary care (e.g., medical specialists in the hospital setting).<sup>4</sup> Meanwhile, the tendency is to provide healthcare for patients in a primary care setting whenever possible, leading to increased patient transitions.<sup>5</sup> As both complexity and transitions in care are related to a risk of error, it is important to share knowledge and to provide coherent and coordinated care to prevent adverse events.<sup>4,6-9</sup> Therefore, intraprofessional collaboration (intraPC) between primary and secondary care physicians is becoming increasingly important.<sup>10-14</sup> There are, however, misunderstandings and paradigm conflicts between primary and secondary care physicians<sup>14-19</sup>, such as imbalance in authority, power conflicts, lack of knowledge of each other's roles and boundary friction when delivering patient care. These can negatively impact collaborative care and therefore negatively impact patient care and safety.<sup>15,16</sup> As proficient intraPC is vital to maintain quality of care,<sup>12,13,15,20</sup> and to preserve continuity of care,<sup>7,14,21,22</sup> intraPC learning requires attention<sup>14,23,24</sup>

Previous studies have shown that primary care (PC) and secondary care (SC) residents are predominantly trained in isolation from each other and that they do not tend to build professional relations with each other due to clinical commitments, logistical challenges and curricular limitations.<sup>25,26</sup> A distinctive moment when PC residents and SC residents do meet is during hospital placements where PC residents work at the same hospital department as SC residents.<sup>27</sup> Hospital placements are a regular element of postgraduate training programmes of PC residents and occur worldwide.<sup>27-32</sup> Prior studies have shown that these placements provide numerous opportunities for intraPC learning<sup>25,27,33</sup>, but that these opportunities require specific interventions to support and enhance learning.<sup>27</sup>

To date, evidence of the characteristics and the process of designing and developing educational activities, specifically targeting intraPC learning during hospital placements, is lacking. Hospital placements are complex settings that are affected by many factors, including stakeholders from different professions with their interpersonal dynamics, different interests and delicate collaboration.<sup>34-36</sup> The development of feasible and applicable intraPC educational activities in such a complex context requires a systematic approach that integrates (learning) theory and involves relevant stakeholders to align theory with local practical contexts.<sup>36-39</sup> To this end, a design-based research approach is useful to first, formulate theoretical Design-Principles based on literature, and second, to enrich and align these Design-Principles with the practice context in close collaboration among researchers and stakeholders with different areas of expertise.<sup>35,39,40</sup> Theory-

driven and context-sensitive Design-Principles can serve as guidance for educational activities<sup>37,41,42</sup> as Design-Principles can provide prescriptive theoretical and practical understanding.<sup>42</sup>

This study aims to develop and substantiate both theory-driven and context-sensitive Design-Principles to guide the development of intraPC educational activities during hospital placements.

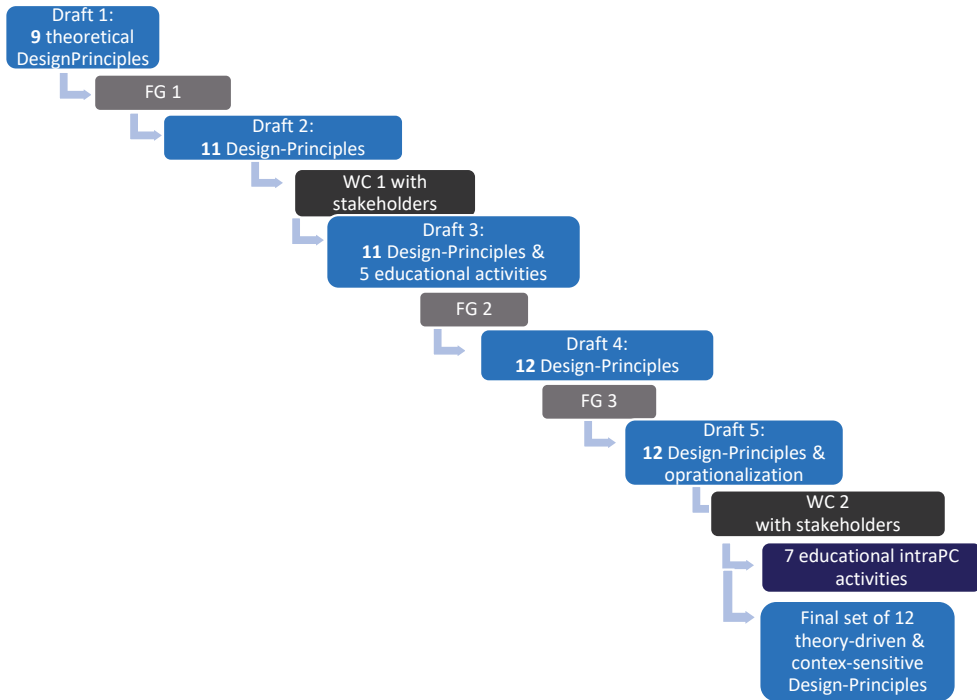
## **METHODS**

This study is part of a Design-Based Research project. Characteristic of Design-Based Research is the discovering, designing, developing and evaluating activities in a systematic and iterative way to solve complex problems in practice.<sup>35,39,40</sup> The starting-point for our Design-Based Research is an educational problem for which no or only a few validated principles (guidelines or heuristics) are available to guide the design and development of educational activities. Informed by prior research and review of relevant literature, researchers in collaboration with practitioners design and develop feasible and applicable educational activities by carefully studying successive versions (or prototypes) of activities in their contexts.<sup>35,40,43</sup> While doing so they reflect on their research process with the purpose of producing Design-Principles.<sup>35,40,43</sup> Design-Principles are typically used as heuristic guidelines to improve educational practice.<sup>35,40</sup>

### **Design**

Within Design-Based Research, three phases can be distinguished: (I) a preliminary phase, (II) a prototyping phase and (III) an assessment phase.<sup>44</sup> In the previous part of our Design-Based Research project (phase I), we gained knowledge of what and how residents actually learn during their hospital placements and what intraPC learning improvements are needed, based on a literature review and observations and interviews with PC residents, SC residents and supervisors.<sup>19,27</sup> In the present study (phase II), the research group developed nine theoretical concepts of Design Principles: Design-Principles-Draft 1. In focus group sessions and work conferences with various stakeholders, Design-Principles-Draft 1 was enriched and consolidated into a final set of validated theory-driven and context-sensitive Design-Principles. An overview of this process is shown in *Figure 1*. The third, assessment, phase is outside the scope of this paper.

We considered an iterative process of focus groups and work conferences an appropriate method for capturing the ideas, perceptions, feelings and circumstances of stakeholders.<sup>45</sup> We used focus group sessions with a Modified Nominal Group Technique (NGT)<sup>46</sup> to discuss, enrich, refine and consolidate Design-Principles. NGT makes use of a prioritizing



**Figure 1.** overall process overview. FG= focus group, WC= Work Conference

process. Variations to this prioritization process are often used in research to fit the purpose and setting of a specific study, which is called a modified NGT.<sup>47-50</sup> We have chosen for individual online prioritization of the design principles after finishing the third focus group session<sup>51-53</sup> We performed multiple focus group sessions with a combination of the modified NGT method as the one described by Seidel and the one described by Søndergaard<sup>49,50</sup> (see Figure 2).

Additionally, work conferences with stakeholders and patients as experts were organized to design prototypes of educational intraPC activities based on the Design-Principles to check feasibility and applicability in practice and to further sharpen formulation of the Design-Principles. An expert work conference has previously been described as a research method<sup>54</sup> for generating creative ideas.<sup>55,56</sup>

## Study setting and participants

### Focus group sessions with NGT

We conducted three focus group sessions in the Netherlands. To enable direct interaction with and observation of the participants, the focus groups were led by a moderator and an observer<sup>45</sup> (FG1: two psychologists (independent researcher and NL), FG2, FG3: educationalist and psychologist (CF and NL)). We included residents, medical directors,

supervisors and educationalists from both primary and secondary care specialty training (see Table 1) with at least six months experience working at a hospital ward and/or coaching residents during hospital placements and/or teaching or investigating intraPC learning. We included six to nine participants per group.<sup>45,57</sup>

### Work conferences

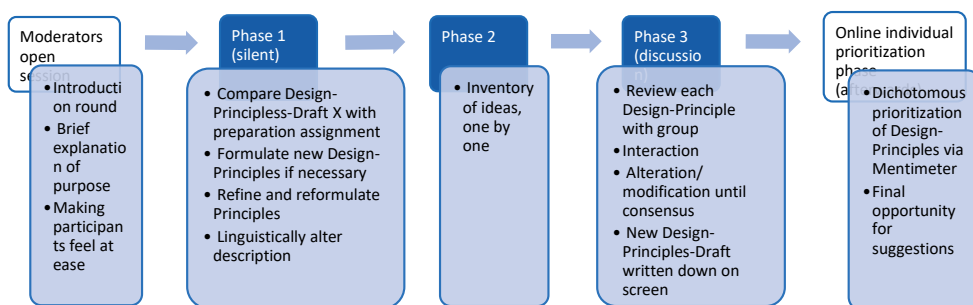
We conducted work conferences with stakeholders from the Netherlands and Belgium which included residents, supervisors, educationalists, policy makers and researchers from primary and secondary care specialty training and patients/caregivers. The invited patients/caregivers had experience as patients or caregivers as well as experience in medical education, and so they were able to bring in the patient/caregiver's perspective in keeping with medical education. The work conferences were moderated by members of the research team and an independent educationalist.

The participants of both the focus group sessions and the work conferences were invited through the research team's network, making use of purposive sampling<sup>45,58</sup> Heterogenous groups were used to gather information from different perspectives and interests across all the disciplines involved<sup>36,45</sup> and to avoid bias that could arise in homogeneous groups<sup>57</sup>

## Procedure

### Focus group sessions

Prior to the focus group session, we sent an information letter stating the purpose of our study together with a preparatory assignment to all participants. The assignment was to think about relevant aspects of intraPC learning experiences. For an overview of the focus group session process, see Figure 2.



**Figure 2.** Process overview of focus group session with modified NGT structure

The Design-Principles (Drafts) were shown and shared on the PC screen. In phase 1 (silent phase), participants were asked to compare Design-Principles-Draft (1/3/4) with their preparation assignment and assess whether their outcome met any of the Design-



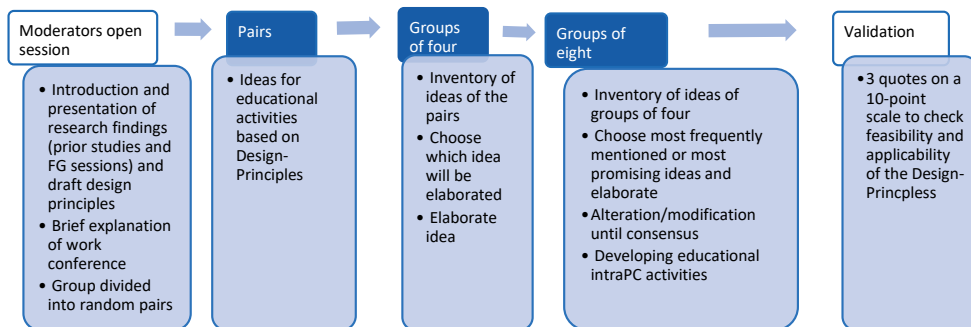
Principles. We asked the participants to refine, reformulate and alter the description of Design-Principles to increase the adequacy of the Design-Principles and possibly to formulate a new Design-Principle if they felt this was necessary. After this phase, participants were invited to contribute their ideas to the group one by one (phase 2). Next, in phase 3, the participants reviewed and discussed each Design-Principle and altered it until the group reached consensus about its formulation.

The Design-Principles-Draft outcome of the previous group was presented to the next group (see Figure 1). The researchers (CF and NL) explained the Design-Principles-Draft and gave a process summary of the previous focus group. The present group then re-edited the outcome of the previous group until consensus about the formulation of Design-Principles. Data was gathered until the last group reached a consensus about the formulation of both the Design-Principles and the operationalizations. As described by Kidd et al. (2000), this process can be seen as a content validation process because each group judges the credibility of outcomes derived from the previous group.<sup>59</sup>

Finally, Design-Principles-Draft 5 was sent to all focus group participants by Mentimeter® as member checking. Participants prioritized each Design-Principle dichotomously as 'must have' or as 'nice to have' and they could comment the final set of Design-Principles.

### *Work conferences*

At the start of each work conference, we presented the results of our previous studies and Design-Principles-Draft 2/5. Next, we divided the participants into pairs and asked them to create ideas for educational activities based on the Design-Principles and think what conditions were needed for applying them. Activities might include, for example, workplace learning activities at the hospital ward, activities during release days where residents learn with colleagues from their own discipline or with intraprofessional colleagues, or training activities for supervisors, etc. Then, the participants discussed their ideas in groups of four, chose the most promising idea and elaborated this further. Finally, the ideas were discussed in groups of seven to eight until consensus was reached on the most promising idea(s). After that, the groups of seven to eight participants developed prototypes of educational activities for intraPC learning. During this process, the patients/caregivers provided feedback on the activities. For an overview of the work conference process, see Figure 3. At the end of work-conference-2, participants were asked to rate three quotes on a 10-point scale to check the feasibility and applicability of the Design-Principles. The quotes were about 1. feasibility of Design-Principles to design intraPC educational activities, 2. clarity of the way Design-Principles were formulated, and 3. applicability of Design-Principles in real life.



**Figure 3.** Process overview of two work conferences

### Data analysis

Data collection and analysis occurred iteratively, and the data were discussed both between the moderator and observer and, within the research team, between the different steps of the process.<sup>45</sup> An iterative process was used while building and enriching Design-Principles. The data gathered in the individual steps (focus groups and work conferences) and throughout the whole process, functioned as a logbook to describe the process of the development of Design-Principles, to illustrate how the Design-Principles came about. It is common within Design-Based Research to integrate one interim outcome into the next step of the development process.<sup>38</sup> Supplemental data gathered during the focus group sessions (by audio-recordings and transcripts) and work conferences were reread to substantiate the formulation and content of the Design-Principles and to capture non-verbal communication, interaction between participants and atmosphere.

### Ethical considerations

This study was approved by the Ethical Review Board (ERB) of the Dutch Organization for Medical Education NERB dossier number: 2020.1.4. Written informed consent for the use of the audio recordings and gathered data was obtained from the participants.

## RESULTS

We conducted three focus group sessions taking between 77-99 minutes per group with a total of 23 participants; the first was conducted live at the Radboud University Medical Center in February 2020; the second and third focus groups were conducted online via Zoom during the Covid pandemic in October and November 2020. The online prioritization survey was completed by 20 out of 23 focus group participants in December 2020.

We conducted two work conferences (120 resp. 180 minutes per conference) with a total of 58 participants (10 resp. 48); the first was conducted live at the Radboud University

Medical Center in March 2020; the second was conducted online via Zoom in February 2022. The online survey questions for validation of Design-Principles were completed by 43 out of 48 participants in work-conference-2. For an overview of participants' characteristics, see Table 1.

Participant characteristics	Focus groups		Work conferences		
		Male	Female	Male	Female
<b>Secondary Care Residents</b>	<b>6</b>	(2	4)	<b>7</b>	(2 5)
<i>Geriatrics</i>	3	(1	2)	3	(2 1)
<i>Internal medicine</i>	1	(1	0)	-	- -
<i>Paediatrics</i>	1	(0	1)	2	(0 2)
<i>Hospital physician</i>	1	(0	1)	-	- -
<i>Surgery</i>	-	-	-	1	(0 1)
<i>Neurology</i>	-	-	-	1	(0 1)
<b>Primary Care Residents</b>	<b>5</b>	(0	5)	<b>8</b>	(1 7)
<i>General Practitioner</i>	2	(0	2)	4	(0 4)
<i>Elderly care Physician</i>	3	(0	3)	4	(1 3)
<b>Secondary Care Supervisors</b>	<b>4</b>	(0	4)	<b>8</b>	(1 78)
<i>Geriatrician</i>	2	(0	2)	3	(0 3)
<i>Internist</i>	1	(0	1)	1	(0 1)
<i>Elderly care physician 2<sup>nd</sup> care</i>	1	(0	1)	-	- -
<i>Paediatrician</i>	-	-	-	3	(1 2)
<i>Geriatrician- pharmacologist</i>	-	-	-	1	(0 1)
<b>Primary Care Teachers Supervisors</b>	<b>5</b>	(0	5)	<b>11</b>	(3 8)
<i>General Practitioner</i>	4	(0	4)	7	(1 6)
<i>Elderly care physician</i>	1	(0	1)	4	(2 2)
<b>Educationalists</b>	<b>3</b>	(1	2)	<b>8</b>	(1 7)
<b>Researchers/policy makers</b>	-	-	-	<b>8</b>	(1 7)
<b>Patients/ Caregivers</b>	-	-	-	<b>8</b>	(3 8)
<b>Total</b>	<b>23</b>	(3)	(20)	<b>58</b>	(12) (46)

**Table 1.** Participants in three focus group sessions and two work conferences

## Design Principles

The initially theory-driven Design-Principles-Draft 1 consisted of nine Design-Principles divided into three clusters: Design, Practical Aspects and Culture. Two new Design-Principles (4 and 8) were added during focus group 1, and one more Design-Principle (Zero) was added during focus group 2. The remaining Design-Principles 1, 2, 3, 5, 6, 9, 10 and 11 and the operationalizations were discussed, modified and linguistically refined in all focus group sessions and work conferences. In general, participants were in full

Design Principles	
	<p><b>0 The patient is the starting-point for working and learning</b></p>
Culture	<p><b>1 Build relations with intraprofessional (primary-secondary care) colleagues</b> PC and SC residents and supervisors invest in building equal interpersonal relations founded on mutual respect and appreciation.</p> <p><i>Operationalization:</i> <i>Getting to know each other informally, building primary-secondary care collaborative relations.</i> <i>Investing in formal primary-secondary care collaborative relations and investing in getting to know each other's work areas.</i></p>
	<p><b>2 Apply the principle that, in an intraPC partnership, we are all different but operate on a basis of equity</b> Supervisors and PC and SC residents create a safe learning and working environment in which culture, equity and differences in work relations can be discussed</p> <p><i>Operationalization:</i> <i>A safe working and learning climate (psychological safety), in which everyone feels free to raise questions or make contributions without this having any negative consequences. 'Learning how to) collaborate intraprofessionally' on the basis of equality and respect. Recognizing historical patterns and feelings of differences in power and culture and opening these up for discussion.</i></p>
Connecting Contexts	<p><b>3 Facilitate learning together by working together</b> Those responsible for curricula ensure that the <i>physical</i> workplaces and work schedules facilitate <i>daily collaboration</i> and mutual learning between PC and SC residents.</p> <p><i>Operationalization:</i> <i>Facilities: physical time and space for encounters.</i> <i>Create time and space for supervision and team reflection and joint education.</i></p>
	<p><b>4 Facilitate the acquisition of knowledge of one another's work contexts and activities to promote good collaboration.</b> Those responsible for training programmes facilitate residents in getting to know each other's contexts, interests, needs, (im)possibilities, activities and necessities so as to improve collaboration for quality care</p> <p><i>Operationalization:</i> <i>For example by having SC residents do placements in primary care.</i></p>
Making the implicit explicit	<p><b>5 Collaborate on patients and pay deliberate attention to two-way learning from different perspectives.</b> Supervisors, teachers and residents make sure that joint workplace learning places the patient at the centre as seen from each other's (PC and SC) perspectives and curiosity. Supervisors, teachers, designers, and residents make sure that form and content do justice to the perspectives and the expertise of both PC and SC residents and supervisors.</p> <p><i>Operationalization:</i> <i>Proactive two-way learning and making intraPC learning explicit.</i> <i>PC residents contribute their own experience and knowledge to secondary care.</i></p>
	<p><b>6 Purposely discuss intraPC collaboration during daily work activities.</b> Residents and supervisors utilize everyday work meetings and patient transfers etc. for talking about and reflecting on intraPC explicitly.</p> <p><i>Operationalization:</i> <i>Explicitly implement a mindset for developing intraPC (awareness) and make sure that 'learning intraPC' is embedded in the workplace.</i></p>

Design Principles	
Making the implicit explicit	<p><b>7 Supervisors themselves engage in intraPC as role models.</b>                      By their own actions, supervisors can teach residents aspects of intraPC. Aware of the residents' work contexts, supervisors should stimulate residents to engage in intraPC.</p> <p><i>Operationalization:</i>                      Provide exposure to intraPC learning activities in placement workplaces.                      Trainers/supervisors are active role models for intraPC.                      SC trainers/supervisors are aware of PC residents' work contexts.                      Trainers/supervisors have the knowledge, skills and attitudes to coach residents in intraPC and connect with both contexts.</p>
	<p><b>8 The training team engages explicitly in intraPC with the aim of delivering quality patient care and achieving continuous quality improvement.</b></p> <p><i>Operationalization:</i>                      The training team regularly reflects on its own intraPC approach and its effect on care and undertakes to work on areas for improvement (case discussion, 360 degree feedback, patient satisfaction, discussion of complications, feedback to residents upon placement completion).</p>
	<p><b>9 Bodies responsible for specialty program goals define intraPC as a competency that every doctor should have.</b>                      Formalize competencies and attainment targets relating to intraPC in the national, local and individual training plans of all specializations.</p> <p><i>Operationalization:</i>                      Pay explicit attention to intraPC by PC and SC residents (in the workplace, the educational institution, the curriculum and peer groups on release days).                      Focus on purposely intraPC learning (placement host)                      Facilitate getting to know each other's expertise and roles and ways of collaboration (placement host and curriculum).</p>
	<p><b>10 Supervisors, teachers and residents work to ensure that every resident knows how to engage in intraPC upon completion of their training.</b>                      Regular discussion and assessment of residents' intraPC progress by supervisors.</p> <p><i>Operationalization:</i>                      Supervisors and residents utilize scheduled training meetings and assessments to discuss and evaluate intraPC.</p>
	<p><b>11 Residents transfer intraPC lessons and apply them in their own work contexts.</b>                      SC supervisors and PC teachers encourage Pc and SC residents during placements to discuss how intraPC lessons can be translated, transferred, transformed and integrated into their own work activities.</p> <p><i>Operationalization:</i>                      Facilitate conversations between PC and SC residents as well as between each of these groups with their peers.                      Connect both contexts by making explicit links between residents' placement experiences and their own work contexts in PC and SC settings.</p>

**Table 2.** Final set of twelve Design Principles for learning intraPC during hospital placements categorized into three clusters, entitled: **Culture** (Zero, 1, 2), **Connecting Contexts** (3, 4) and **Making the Implicit Explicit** (5-11). The Design-Principles consist of two parts: i) a title, describing the design principle (the dot on the horizon) and a subtitle, describing how the Design-Principles aim can be achieved; ii) an operationalization, describing what could be done to achieve the Design-Principle aim.

agreement that these principles needed to be translated into their own local practices in order to make Design-Principles applicable and appropriate to all stakeholders involved.

Our study resulted in a final set of twelve Design-Principles for intraPC learning during hospital placements categorized into three clusters, entitled: *Culture* (Zero, 1, 2), *Connecting Contexts* (3, 4) and *Making the Implicit Explicit* (5-11) (See Table 2). The majority of Design-Principles consisted of two parts: i) a title, describing the design principle (the dot on the horizon) and a subtitle, describing *how* the Design-Principle aim can be achieved; ii) an operationalization, describing *what* could be done to achieve the Design-Principle aim.

### The Culture cluster

The Culture cluster included three Design-Principles (zero, 1, 2) that focused on the central role of the patient (zero) and on building collaborative relations based on equity between PC and SC physicians (2) and on building a safe learning environment where traditional power and culture differences between PC and SC physicians can be discussed (3). All FG participants agreed that Design-Principle-**zero** should be the starting-point of intraPC learning.

‘The Design-Principles should start with Design-Principle-zero such as “this is about good care for patients”. To get an SC physician on board, the patient needs to be prominently positioned in the Design-Principles, I think. [...] The patient is involved in everything we do: it’s all about the patient, and we will use these design principles for the benefit of patient care, so the patient should be the foundation.’  
SC supervisor\_FG2

Design-Principle-2 was initially formulated as ‘There is a safe learning environment where culture and power differences can be discussed.’ During all three focus group sessions, several SC participants initially commented that it was unnecessary or too severe to include power differences in the Design-Principles because, in their view, there were no power differences at play, only cultural differences. The PC participants, however, explicitly mentioned that they did experience power differences between PC and SC on a regularly basis. During the discussions in all FGs, participants unanimously agreed that Design-Principle-2 should focus on equity in working relations. The original Design-Principle-2 was finally adapted and entitled: ***Apply the principle that, in a intraPC partnership, we are all different but operate on a basis of equity*** and sub-titled: ‘Supervisors and residents create a safe learning and working environment in which culture, equity and differences in work relations can be discussed’. The operationalization was finetuned by FG3, focusing on a safe working/learning climate, respect, and the recognition and discussion of power/cultural differences.

One SC resident said, “Power differences” sounds very weighty to me. I think it’s enough just to mention cultural differences.’ An SC supervisor nodded in agreement, whereas a PC supervisor and resident both rose in their chairs and responded with disapproval. Fieldnote\_FG1

‘There are definitely certain power relations at play’. PC resident\_FG2

‘I notice that many PC physicians and residents struggle with the power differences with [SC physicians in] the hospital.’ PC supervisor\_FG2

‘Of course, there’s a lot of complaining about primary care, like “they’re all dullards”. I think it’s not very conducive if you hear that every day. [...] It’s about respect, appreciation and equality’ SC resident\_FG3

‘Could we then just call it differences [...] we’re all different yet equal in collaboration’ SC supervisor\_FG2

Participants also emphasized the importance of building relations in the Design-Principles (1), as this was vital to establishing equal and mutual intraPC.

‘Building relations is important, but this is sometimes avoided in the hospital. Without building relations, there can be no [equal] collaboration, but rather one-way cooperation with someone wanting something and the other person having to do it.’ SC resident1\_FG3

‘First build relations, and then make sure that we work with each other on an equal basis’ SC resident2\_FG3

### **The Connecting Contexts cluster**

The Connecting Contexts cluster includes two Design-Principles (3, 4) that involve connecting and aligning primary and secondary care by mutual learning and collaboration between PC and SC residents and supervisors (3) and by acquiring knowledge of each other’s work contexts and activities (4). FG participants noted that mutually sharing each other’s contexts and activities was essential to learning how to align PC and SC and provide continuity of care. FG1 formulated a new Design-Principle (4), which was further refined by FG2 and FG3 into: ***Facilitate the acquisition of knowledge of one another’s work contexts and activities to promote good collaboration.***

'I'm in favour of mutual exchange [of placements] because then you [SC residents] also know where your patients are going to and coming from and how that [referral] goes.' PC resident\_FG1

'When I've seen a patient in the hospital and want to transfer him properly to primary care, what exactly does a PC physician need to know from me [SC physician] in order to continue to properly manage care? This is something I'd like to know' SC resident\_FG2

During work-conference-2, many participants identified referral and discharge letters as a useful opportunity for intraPC educational activities, See box 2.

Title education	Learning from referral to and discharge from the hospital
<b>Education goals</b>	Sharing and getting to know each other's perspective on: 1. discharge from ward or outpatient department to home or nursing home 2. referral from primary care to hospital Being able to write appropriate referral and discharge letters with knowledge of the different perspectives (PC and SC physicians)
<b>Live, online, hybride</b>	Live at the hospital ward during daily work or education session
<b>Participants</b>	PC residents, SC residents, SC supervisors
<b>Preparation for participants</b>	Every participant selects a referral and/or a discharge letter and bring these anonymized letters to the joint discussion session.
<b>Practicalities</b>	Allocated time: e.g. 30-45 minutes a month during workplace learning or during an educational session in the ward.
<b>Method</b>	PC and SC residents and supervisors discuss referral letters and discharge letters. E.g. 2-3 referral letters and 2-3 discharge letters during a session. Start: Present a patient case and read the letter. Dialogue: Based on the letter, participants discuss the goals of the referral and discharge letter, participants give each other feedback and share their perspectives. E.g. referral: Is the referral question clear and is the referring perspective clear? E.g. discharge: Is the question of the PC physician addressed properly in the discharge letter? Do the treatment recommendations fit the PC context? Debriefing: what would you do differently after this discussion.
<b>Design Principles</b>	0, 3, 4, 5, 6, 8

**Box 2:** Prototype of educational activities for intraPC learning developed based on the Design-Principles during work conference 2



### The Making the Implicit Explicit cluster

The Making the Implicit Explicit cluster included seven Design-Principles (5-11) that involved interventions for intraPC learning both on the job and off the job explicit and intentional: paying deliberate attention to different perspectives (5) and intraPC during work activities (9), the encouragement of a 'practise what you preach' role model function from supervisors and the supervising team by demonstrating and continue advancing intraPC (7, 8), setting intraPC learning goals and competency profiles (9), and evaluations and assessments of intraPC during daily work (10, 11).

On Design-Principle-5 (***Collaborate on patients and pay deliberate attention to two-way learning from different perspectives***), the FG3 participants discussed sharing professional expertise, emphasizing the importance of proactively contributing PC knowledge during hospital placements to make SC physicians and residents aware of the possibilities and impossibilities in the PC setting.

'SC physicians do not know very well what the struggles or impossibilities are in primary care. This is also where the comments arise [by SC physicians about PC physicians]. I would say PC residents bring PC knowledge and experience into the secondary care setting, structurally.' SC supervisor\_FG3

Design-Principle-10 (***Work to ensure that every resident knows how to engage in intraPC upon completion of their training***) indicated that intraPC should be assessed as an important competency in various activities in the workplace. Residents in FG3 mentioned, however, that self-assessments are likely to produce socially desirable answers that, hence, will fail to achieve their purpose. It is important for intraPC assessment to be linked to the existing assessment policies and tools in the training programme, by discussing and evaluating intraPC during regular supervision meetings, for example.

'Testing and assessing intraPC is difficult, I think. If we can fill in the questionnaire with socially desirable answers, that's a risk. To me, talking and learning about intraPC is more important than us going back to filling out assessments because that will fail to achieve the goal.' SC residents\_FG3

In order to facilitate intraPC learning among residents, the FG1 participants noted that the supervising team should also keep training themselves in intraPC based on the DPs. Therefore, a new Design-Principle (8) was added (***The training team engages explicitly in intraPC with the aim of delivering quality patient care and achieving continuous quality improvement***). FG3 participants, furthermore, noted that the supervising team should reflect on both the process and the outcome of intraPC.

‘You can only teach residents about intraPC if we ourselves, as a supervising team, also work and collaborate as an interprofessional team according to certain principles. Before we facilitated intraPC learning in our department, we first reflected in our team “how do we collaborate [with primary care] as a department, what goes well, what improvements are needed and how are we going to work on/achieve that.” SC Supervisor\_FG1

In the next round, FG2 participants indicated the importance of having role models: individual supervisors demonstrating intraPC as physicians and departmental teams demonstrating continuous development in intraPC as a team. Since supervisors themselves may not yet be so adept at intraPC, FG participants emphasized that there should be space for supervisors to continue to learn intraPC themselves.

“Supervisors can teach residents aspects of intraPC based on their own actions”, I like that. You rely on supervisors who are intraPC collaborators themselves. And that [doing intraPC] is the starting-point for teaching other people. These Design-Principles don’t say that supervisors have to do it all perfectly, but it’s just a starting-point to talk about intraPC with residents’. Educationalist\_FG2

### **Design-Principles relevancy and applicability**

Online prioritization with Mentimeter© and online poll quotes resulted in quantitative data consisting of individual dichotomous prioritization of the Design-Principles and lists of 10-point scales.

Both the focus group discussions and the online prioritization surveys revealed that the participants unanimously agreed that the Design-Principles belonging to the *Culture* theme (**zero, 1, 2**) are ‘must haves’, and should be considered as prerequisites for successful intraPC learning. Regarding the Design-Principles in the *Connecting Contexts* cluster and the *Making the Implicit Explicit* cluster, participants differed in their prioritization, that depended strongly on the pre-existing workplace conditions.

The online poll quotes using a 10-point scale (1-10) to check the feasibility and applicability of the Design-Principles resulted in the following mean scores: I) ‘The Design-Principles are feasible for designing intraPC educational practice’, mean score: 7.2. II) ‘The Design-Principles are clearly formulated’, mean score: 7.6. III) ‘The Design-Principles are applicable in my daily work’, mean score: 7.3.

Some educationalists and policymakers mentioned that they do not design their own education, but that the Design-Principles are nevertheless useful for them to verify whether intraPC educational activities meet relevant characteristics.

'the Design-Principles help to reflect on whether all essential characteristics have been addressed.' Policy-maker\_WC2

## DISCUSSION

In this study, we developed a set of twelve theory-driven and context-sensitive Design-Principles for learning intraPC between PC and SC residents during hospital placements. The Design-Principles were categorized into three clusters: *Culture*, *Connecting Contexts* and *Making the Implicit Explicit*. The *Culture* cluster focuses on building relations based on equity allowing space to openly discuss traditional power dynamics and cultural differences between PC and SC physicians. The *Connecting Contexts* cluster focuses on connecting primary and secondary care and having PC and SC residents understand each other's work contexts and activities. The *Making the Implicit Explicit* cluster focuses on residents deliberately paying attention to intraPC learning on the job and off the job, and on having supervisors demonstrate and continually advance intraPC, also known as 'practise what you preach'.

In a prior study, Kilty et al. described essential baseline conditions for learning in a clinical environment during postgraduate training.<sup>60</sup> Our study provides a valuable complement to this study by providing Design-Principles specifically aimed at designing intraPC learning between PC and SC residents during hospital placements. Our findings on the importance of a safe culture to enable intraPC learning is in line with prior studies.<sup>60,61</sup> With the Design-Principles in the *Culture* cluster, moreover, we have formalized the creation of a culture of equal collaboration and learning in which power dynamics between PC and SC physicians can be discussed. Our study revealed that *Culture* cluster Design-Principles are prerequisites for intraPC learning in hospitals.

### Power dynamics

Throughout the development of our Design-Principles, the topic of power dynamics emerged strongly and was consequently embedded in the final set of Design-Principles. Power dynamics are often present in education and interprofessional collaboration<sup>62-64</sup> in PC residents' hospital placements<sup>19,65,66</sup> and can demotivate residents<sup>67</sup> Nonetheless, minimal attention has been given to these dynamics in medical education research.<sup>19,62,68</sup> As a result, power is underexposed when developing educational activities.<sup>62</sup> In Design-Principle-2, power differences are addressed on both levels: differences between PC and SC physicians and those between residents and supervisors. Power dynamics between PC and SC physicians persist tacitly, with PC often seen as having a lower status.<sup>16,19</sup> During all focus group sessions, power dynamics and the imbalances in their impact were confirmed when SC residents and supervisors opted to remove 'power differences'

from the Design-Principles (Design-Principle-2) because they felt that these were merely cultural differences. The PC participants, however, explicitly mentioned that they often struggled with power differences with SC physicians. We hypothesize that these different experiences of power dynamics can be attributed to the difference in their impact: lower-status individuals appear to be more troubled by power dynamics than higher-status individuals. This complexity should be taken into account when designing intraPC educational activities, for example by recognizing historical patterns and feelings of differences in power and culture and opening these up for discussion.

### **Mutual and transformative learning**

Participants mentioned that alignment of PC and SC and improvement of intraPC can be achieved if both PC and SC physicians get to know each other's work contexts and activities. This can be facilitated by exchanging residents between each other's settings. Sampson<sup>69</sup> already demonstrated that educational activities across PC and SC silos could be used to modify behaviour and increase understanding. Göbel et al.<sup>70</sup> opted for feedback between PC and SC physicians through frequent meetings to support intraPC. These observations are affirmed and further developed in our study, particularly as formalized in Design-Principle-3: *'Facilitate learning together by working together'* and Design-Principle-4: *'Facilitate the acquisition of knowledge of one another's work contexts and activities to promote good collaboration'*.

After the hospital placements, PC and SC residents have to transfer acquired knowledge, skills and insights concerning intraPC into their own (or future) work context. From the boundary crossing theory perspective, this can add to transformative learning, with both parties creating new ways of working in connection with each other.<sup>71</sup> Transformative learning requires that members of two communities of practice work and learn together. This could be complex during hospital placements as only PC residents cross boundaries of their own practice into a new community of practice, SC settings, often resulting in unidirectional learning. PC residents learn predominantly unidirectionally from SC residents and supervisors.<sup>27</sup> For transformative learning to take place transfer to the own community of practice is required. Design-Principle-11, was developed to bridge both communities of practice and promote transformative learning. In Design-Principle-11, we formalized mutual transformative learning by having regular discussions facilitated by SC supervisors and PC teachers. During educational activities, these discussions could explicitly address the factors that influence transformation leading to profound changes in intraPC or new jointly constructed intraPC practice.

### **Practise what you preach supervisor (team)**

Participants in our study called for an active role of the entire supervising team in demonstrating and providing intraPC learning. This is in line with theories of workplace

learning.<sup>72,73</sup> Workplace learning processes are mostly unintentional, spontaneous and happening more or less unconsciously as a result of residents' daily work activities, rather than as a result of highly structured teaching programmes.<sup>72</sup> We speak of professional learning in the workplace when spontaneous and often unconscious learning processes are connected to conscious reflection and interaction.<sup>73</sup> Hospital placements are a special kind of workplace learning. For a long time, physicians were trained by way of apprenticeship models, granting residents legitimate entry into a community of practice.<sup>74</sup> Our wider understanding of apprenticeship has recently undergone a change<sup>75</sup>: where the old apprenticeship models stressed immersion learning by simply gaining experience through exposure, new apprenticeship models stress that residents also learn from their role models how to think and reflect on the job. Supervisors, therefore, should take the lead as role models in intraPC and reflect on their own performance as a team and residents themselves should also play an active role in facilitating their own intraPC learning process.

### **Implications for practice and future research**

We have chosen to use Design-Principles as a guideline, a heuristic, which is a commonly used definition.<sup>76,77</sup> As Bakker<sup>76</sup> describes it, this is 'something to consider and try out, with the common sense understanding that no two situations will be identical and that adaptation to local circumstances is always necessary.'<sup>76(p.52)</sup> This means that Design-Principles should not be taken as prescriptions, but rather as guidelines that are meant to be achieved in a particular setting, supported by goals.<sup>76,77</sup> Our theory-driven and context-sensitive Design-Principles were developed to guide the design of intraPC education between PC and SC residents during hospital placements, but we believe they could be adjustable in other contexts as well. Although participants of our work conferences found the Design-Principles clear and feasible for designing intraPC educational activities, our study was conducted as prototyping phase in Design-Based Research. Future research could further assess applicability of the Design-Principles in educational practice in order to complete the Design-Based Research approach.

Off course the Design principles will be assessed in phase III (assessment phase) of the Design-Based Research. In a next study, we will investigate the educational interventions based on the principles. Beyond that, these Design-Principles can be taken into account in the reflection and feedback cycles when assessing residents. For instance, including patients and caregivers in providing feedback to residents, how patient-centred care was provided by the resident, explicitly indicate, ask for and discuss cultural aspects of intraPC experienced by the resident, explicitly ask for learning from mistakes, utilize scheduled training meetings and assessments to discuss and evaluate intraPC etc.

By working with stakeholders, we were able to verify that the Design-Principles are attractive and user-friendly to those who have to work with them. In this regard, it is

important to be aware of certain language used in Design-Principles. As Cahn<sup>78</sup> argues, curriculum developers often intend to create education with conceptual and logistical barriers in mind but tend to overlook the semantic element of language.<sup>78</sup> Certain words could (un)consciously send messages that undermine the value of specific team members. This could expose any power dynamics even more explicitly and take the focus away from the collaboration<sup>78</sup> one is striving to improve. The importance of language and nuance emerged during our study, as participants paid explicit attention to the wording of sentences and the description of words. As one FG2 participant said, 'I like that, it's very much about language. That's actually at the basis of everything we do, to come up with a new common language that everybody understands.'

We think that the description of the development of Design Principles, together with stakeholders, researchers and patients/caregivers, provides a demonstration of a method that could be used for approaching complex educational challenges. As such, the design principles themselves could be used to guide intraPC educational activities. Furthermore, the description of developing these principles could be used as a method for approaching educational challenges such as enhancing collaboration between physicians.

### **Strengths and limitations of the study**

A strength of this study is the start with solid theoretical data and the use of focus groups and work conferences, where rich and in-depth data emerged from the interaction between participants from different areas of expertise and different communities of practice.<sup>36</sup> Another strength is that this study focuses on both refining and testing context-sensitive Design-Principles and designing practical prototypes of activities in an iterative process.<sup>36,39</sup> In Design-Based Research for education development, researchers often serve as developers of educational activities.<sup>79-81</sup> Their active involvement in learning and teaching procedures, engaging with stakeholders, manifests scientific and educational value.<sup>79,80</sup> Furthermore, the process of developing Design-Principles can also be informative. Another strength is the transferability of design principles to a wide range of hospital placements. Although postgraduate training varies considerably both within and across countries and cultures, there are also strong similarities: postgraduate training around the world is predominantly workplace-based; residents in training for PC or SC physician undertake placements in their own specialty and additionally in other specialties. It is common worldwide for PC residents to spend a majority (months or years) of their training in the hospital<sup>30,82</sup>. Most training programs for SC residents also consist largely of out-of-specialty placement in various hospital departments of other specialties worldwide<sup>83-86</sup>. During these placements, residents work with residents from other PC and SC specialties in the same hospital ward and have the opportunity to learn intraPC. Since these placements have similar practices, such as patient-centred workplace learning, the existing power dynamics and cultural differences between specialties, the need to get to

know and understand each other's work contexts and supervisors who continue to develop intraPC as role models, we think the Design-Principles will be relevant to a broad range of international postgraduate training.

Our study also has limitations. This study was conducted in the Netherlands with reference to the Dutch postgraduate training programmes. Even though many countries operate similar hospital placement programmes and settings, we did not uncover global principles. We do, however, argue that the Design-Principles may be adapted in countries where the placement setting is somewhat different. Every postgraduate training programme must, therefore, keep its own particularities in mind when implementing these Design-Principles in its own setting and when evaluating their application. By providing rich context descriptions with our focus group sessions and work conferences and by including professionals and residents from different professional backgrounds as well as patients/caregivers, this study provides guidelines (Design-Principles) that are transferable to a wide range of hospital placements or other medical workplace learning environments.<sup>45</sup>

## **Conclusion**

To facilitate intraPC learning during hospital placements, designing activities on various levels is needed: 1) *Culture*: building collaboration based on equity in a psychologically safe learning/working environment where patterns or feelings of (in)equality, power dynamics, and cultural differences can be discussed; 2) *Connecting Contexts*: making residents and supervisors understand each other's work context and activities by mutual learning and exchanging residents in each other's settings; 3) *Making the Implicit Explicit*: by consciously focusing on residents' intraPC learning and by having supervisors act as role models demonstrating intraPC and continuously pursuing intraPC improvement as a team.

## **Data Availability Statement**

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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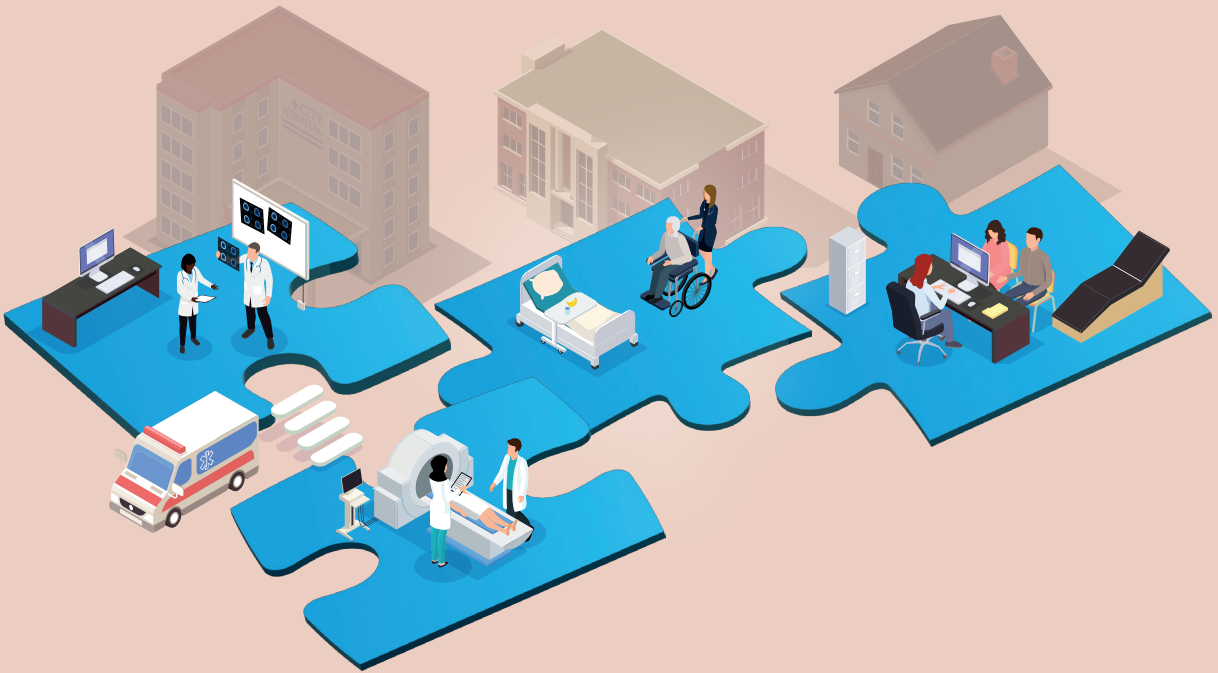
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*“Coming together  
is a beginning,  
Keeping together  
is progress,  
Working together  
is success”*

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**Henry Ford**





# CHAPTER 7

General Discussion



## MAIN FINDINGS

The overall goal of this research project was to illuminate the current development of intra-professional collaboration (intraPC) competencies during hospital placements and to uncover opportunities for promoting the learning of intraPC by residents. The aims of this thesis were (i) to gain insight into the potential of hospital (out-of-specialty) placements for intraPC learning; (ii) to enhance our understanding of context, culture and power dynamics on hospital wards and pave the way for future constructive collaborative learning and practice; and (iii) to develop evidence-based recommendations for designing postgraduate out-of-specialty placements and design principles for intraPC learning among medical residents during hospital placements and to develop (prototypes of) intraprofessional learning activities. We explored what might work to improve intraPC by identifying and describing problems and empirically investigating facilitating factors and providing directions for solutions.

Our scoping review (Chapter 2) shows that out-of-specialty placements have the potential to enhance learning that improves the residents' expertise in their own specialty such as medical competency, attitudes towards other specialties and their patients and inter-/intraprofessional collaboration. However, learning during out-of-specialty placements is often sub-optimal. Simply "sitting in" and "working along" are not enough for out-of-specialty placements to be effective. The development of knowledge and skills acquired during these placements will be more advanced if attention is paid to the relevance, connection and the transfer of this knowledge into the residents' own specialty context and if there is a focus on intraPC as a learning outcome.

The findings of our ethnographic research (Chapter 3) demonstrate that hospital wards are rich in opportunities to learn intraPC between primary care and medical specialty residents, but learning such collaboration does not take place spontaneously. Residents and supervisors hardly appear to recognize opportunities for learning intraPC during work activities; primary care residents often adapt to the role of medical specialty residents and hardly ever contribute their primary care expertise, and medical specialty residents are accustomed to teaching primary care residents but are not accustomed to asking for their primary care expertise. Residents and supervisors indicated that intraPC learning is essential and requires explicit attention. In order to benefit from the abundant opportunities for learning intraPC bidirectionally, adjustments in the set-up of hospital placements are needed, starting with dedicated time and goalsetting for intraPC and a collaborative culture with limited hierarchy in the hospital department.

The role of hierarchy is explored in Chapter 4. We show that power dynamics are omnipresent in hospitals and have an impact on intraPC learning among residents. Even

with the power distance being small, the higher-status medical specialist resident can easily (unintentionally) overpower the lower-status primary care resident. This hinders intraPC learning. Constructive power dynamics, however, could empower intraPC learning. Constructive power dynamics occur when a hierarchical power distribution is based on a functional division of roles and responsibilities, combined with sincere open interactions, actively inviting each other into discussions and collaboration based on equity. We found that this can be achieved by residents and supervisors being aware of their implicit beliefs, by making them explicit and by enlisting the supervisors' support to cultivate fearless learning.

The COVID-19 pandemic taught us a lot about the context in which intraPC can flourish (Chapter 5). Collaboration under pressure with a shared lack of knowledge of COVID-19 leads to a high degree of social cohesion and limited hierarchy between specialties and between supervisors and residents. During the COVID crisis, the division of roles and responsibilities was more organic and functional than during non-crises. Repeatedly instructing residents to approach them with questions, supervisors demonstrated a high level of psychological proximity, and they were explicitly transparent about their own clinical uncertainty regarding COVID patient cases. This psychological proximity appeared to be a crucial factor contributing to a safe working/learning climate. The combination of collective uncertainty, social cohesion, psychological proximity and the presence of different specialties in one department fosters residents' fearless intraPC learning.

Chapter 6 shows the development of twelve theory-driven and practice-informed design principles for intraprofessional learning among medical residents, categorized into three clusters: 1) Culture: building collaborative relations based on equity in a psychologically safe context where patterns or feelings of power dynamics between primary care and medical specialty physicians can be discussed; 2) Connecting Contexts: connecting and aligning primary and specialty care by making residents and supervisors mutually share and understand each other's work contexts and activities; and 3) Making the Implicit Explicit: consciously addressing intraPC in learning objectives, assessments and during work activities by having supervising teams act as role models demonstrating intraPC and continuously pursuing improvement in intraPC to make intraPC explicit. The design of intraprofessional learning among residents is ideally a deliberate process in which a distinct focus on culture is a prerequisite to facilitate intraPC learning.

## REFLECTION ON THE MAIN FINDINGS

### **The role of Context, Culture and Power Dynamics**

IntraPC during postgraduate workplace learning sets the tone for the quality of future intraPC. Our findings (Chapters 2-6) show that the empowerment of residents for intraprofessional collaboration goes beyond developing new skills and competencies: it is a matter of creating a culture of sincere equal collaboration and constructive power dynamics for fearless intraPC (learning). The themes of Context, Culture and Power Dynamics appeared to be interacting and to have a direct impact on intraPC learning. The COVID pandemic has shown us that a particular Context (collective uncertainty during crisis and the presence of different specialties in one department), a psychologically safe Culture (social cohesion and psychological proximity) and constructive Power Dynamics (between specialties and between supervisors and residents) create an altered work/learning experience (Chapter 5). A deeper understanding of the role of Context, Culture and Power Dynamics and how we can manage and guide them is helpful and necessary to further improve intraPC. Although the themes of Context, Culture and Power Dynamics are difficult to isolate, we will first reflect on each theme in the broader context of the literature. Thereafter, we will combine the insights. Following the reflections on our main findings, we will reflect on our methodological considerations. Finally, we will discuss the implications for medical education practice and further research.

## THE ROLE OF CONTEXT

### **Postgraduate training**

During postgraduate training, residents develop their identities related to their specialization<sup>1</sup>. These professional identities may enable physicians to do their jobs, but at the same time, these strong identities can also impede effective intraPC<sup>1,2</sup>. Although there is growing evidence in the literature that patients benefit from collaborative care<sup>3,4</sup> and that residents and supervisors believe IntraPC is essential, intraPC learning actually occurs to a very limited extent only, and professional identities are hardly mutually shared (Chapter 3). Evidently, there are still many barriers to overcome before we do in practice what we believe is important<sup>5</sup>. And then, suddenly, the COVID pandemic hit us – and intraPC was all around us overnight. It showed how collective uncertainty can bring physicians from different specialties closer together. They all felt the urge and the need to work together and help each other.

Residents learn while working, followed by processes of interpretation and construction of meaning<sup>6,7</sup>. Ideally, residents should experience an “aha” moment about the value gained for the patients they serve through effective intraPC, to intentionally put time and effort

into intraPC learning<sup>8</sup>. Our findings about learning during Covid have taught us that intraPC learning can be accelerated when residents feel, experience and understand the need to collaborate in order to provide the best quality of care. Then intraprofessional learning activities can foster residents to think about how they have different professional identities on the one hand but share common identities on the other, which can help them develop a sense of team spirit/social cohesion to bridge and connect the professional boundaries<sup>1</sup>.

### **Understanding professional contexts**

Postgraduate training is predominantly workplace-based. Residents undertake placements (rotations) primarily in their own specialty and additionally in other specialties (out-of-specialty placements). Out-of-specialty placements are a special kind of workplace learning as residents shift and cross the boundary of their own specialty and learn in a different clinical and socio-cultural work context<sup>9</sup>. For learning in the workplace to be effective, shared responsibility between supervisors and residents is relevant<sup>6,10</sup>. In “traditional” workplace learning, residents are trained by supervisors who are role-models in the same professional context. In out-of-specialty placements, however, the “guest residents” (e.g., primary care resident at the hospital department) are trained by supervisors from a different clinical and socio-cultural work context. This means that learning and supervision should deliberately focus on integration into the residents’ own specialties. It is particularly important for supervisors, therefore, to realize and understand the guest residents’ professional context, and for residents to understand the out-of-specialty context (Chapter 2). Using daily work activities to explicitly talk about and reflect on intraPC contributes to mutual understanding of work contexts and to empowering intraPC (learning) (Chapters 4 and 6).

### **Bridging professional contexts**

At first glance, guest-residents would seem to have little impact upon the dynamics of a medical specialist team in the hospital. Our findings show, however, that temporary team members can also bring a fresh eye to habitual practices in intraPC, which can lead to intraPC discussions and mutual learning between physicians from different specialties, bridging professional boundaries (Chapters 3 and 4). Boundary objects can also fulfill a specific function in bridging intersecting practices<sup>9</sup>. A boundary object is any object that is part of multiple groups (e.g., contact tools, such as referral letters) and that facilitates intraprofessional communication between them; it may have a different identity for each group, meeting the information requirements of that particular group<sup>9</sup>. Collaboration through boundary objects such as referral letters is not always smooth and often leads to tensions and ambiguity around the division of roles and responsibilities<sup>11</sup>. IntraPC learning activities involving boundary objects are, therefore, relevant to learning to collaborate effectively and to co-developing new intraprofessional practice<sup>9</sup>. These learning activities can be successfully developed based on the design principles (Chapter 6).

During and after the hospital placements, primary care and medical specialty residents have to transfer their acquired knowledge, skills and insights regarding intraPC into their own or their future work context. From the boundary crossing theory perspective, this may contribute to transformative learning<sup>9</sup>. Transformative learning means that both parties work together to develop new ways of doing intraPC<sup>9</sup>. This requires working and learning together and transferring knowledge to each party's own professional context. To provide directions for bridging professional contexts to promote adequate intraPC, we adjusted the 3-P model of workplace-learning (originally presented by Tynjälä<sup>12</sup>), in which the learning context is adapted into the "original professional training context of the learner" and the "learning context of out-of-specialty placement" (Chapter 2). These two contexts should be united. Furthermore, we included the specific design principle "Residents transfer intraPC lessons and apply them in their own work contexts" to underscore the role of medical specialist supervisors and primary care teachers to consciously encourage residents during placements to discuss how intraPC lessons can be translated, transferred, transformed and integrated into their own work activities (Chapter 6).

## THE ROLE OF CULTURE

### Hierarchy

Medical healthcare and residency training have a deep-rooted hierarchical nature<sup>13-16</sup>. Hierarchy is a very fundamental characteristic of professional relationships<sup>17</sup>, and power can operate through established hierarchies<sup>17,18</sup>. Power, seen as the ability to influence others<sup>19</sup>, is an important and pervading feature of the medical environment, both constructed and reinforced by the hierarchies in which physicians interact<sup>20</sup>.

Hierarchy can enact a social order and rules of conduct<sup>18</sup>. As this clarifies roles and responsibilities, on the one hand, it can have a positive effect on the patients' safety and the residents' comfort<sup>18</sup>. As long as there are respectful intraprofessional interactions between different hierarchies, such as interactions between supervisors and residents, intraprofessional collaboration can be encouraged<sup>21</sup>. We showed that a certain degree of hierarchical power distribution is necessary for a functional division of roles and responsibilities and for fostering a work climate that contributes to fearless intraPC learning (Chapters 3 and 4). Hierarchy can build a strong foundation.

On the other hand, medical hierarchy may encourage residents to "fake it till you make it" rather than reveal ignorance and mistakes or ask for help or feedback<sup>18,22</sup>. In order to achieve a desired professional, hierarchical position or make a good impression, residents might infer what behaviors are valued by their superiors and make deliberate investments to meet those expectations<sup>18</sup>.

Residents tend to narrow their reflection on the behaviors that supervisors encourage during workplace assessment<sup>23</sup>. Supervisor trustworthiness helps to empower residents to engage in authentic behaviors, to “show themselves” and to take risks<sup>23</sup>. We show that this can be achieved by a high level of psychological proximity of supervisors (Chapter 5). During COVID, many supervisors were psychologically proximate by repeatedly instructing their residents to approach them with questions, by being easily accessible for consultation and by being explicitly transparent about their own clinical uncertainties. As a result, residents felt more comfortable asking questions and less inhibited by the idea of being judged, which appeared to be essential for creating a safe intraPC learning environment. This is particularly vital when one party is vulnerable in relation to other parties, as in hospital placements, in which primary care residents have an inferior position and are often ranked below medical specialty residents and supervisors (Chapters 2 and 4) .

### **Hospital placements**

Hospital departments are complex, dynamic work contexts that are affected by many factors, including professionals from different specialties each with their own professional norms, interpersonal dynamics and delicate collaboration<sup>24-26</sup>. In such a complex context, it could be challenging for residents to stay motivated when working and learning<sup>27</sup>. Motivation is, however, important for delivering top performance and quality of care<sup>2</sup>. A study by van der Groot et al. showed that residents shape their motivation by their interpretation and evaluation of work activities and their expectations about the future<sup>27</sup>. Residents’ motivation is supported by four aspects of the work context: (i) social interactions, including interpersonal relationships and close collaboration with other residents and supervisors; (ii) organizational features, including learning opportunities and opportunities to influence their own work schedules; (iii) technical tools, including tools to contact supervisors or receive feedback from them; and (iv) physical spaces, including those that enhance the work climate and those that can be adapted to meet colleagues without being interrupted<sup>27</sup>.

Our findings show that the physical proximity of residents and supervisors from different specialties in one department alone is not sufficient to build collaborative relationships between primary care and medical specialty residents (Chapters 3, 4 and 6). We need to focus explicitly on establishing equity in intraprofessional relationships. Our studies show that equity can particularly be promoted by the work context aspects of social interactions and physical spaces, for instance, by sharing a physical space in which everyone sits or stands equally in the room, spending dedicated time together, having sincere open interactions in which thoughts, feelings and learning goals can be shared, actively inviting each other into discussions and being open to other perspectives and by having a drink together outside the workplace.

As there is a two-way interaction between residents and the context and culture<sup>27</sup>, a deeper understanding of how structural forms of power are embedded in and exerted by context and culture is key for residents to positively influence their workplace learning<sup>20</sup>.

## THE ROLE OF POWER DYNAMICS

### Hierarchy & Power dynamics

Power is often interconnected with status<sup>28</sup>. Many of the roles that confer status also confer power and vice versa<sup>28</sup>. Power and hierarchical status in hospitals, often exist as a result of someone's position in time and place, and of his or her personal and professional qualities<sup>2</sup>. Power differentials could affect the interplay between people and lead to power dynamics. We defined power dynamics (Chapter 4) as "the way in which power impacts the interaction of two or more people or groups", for example between physicians from different specialties or between supervisor and resident. Power dynamics between primary care physicians and medical specialists persist tacitly<sup>29,30</sup>. Power and power dynamics are often present in interprofessional collaboration and education<sup>16,31,32</sup> in primary care residents' hospital placements<sup>30,33,34</sup> and can demotivate residents<sup>35</sup>. We demonstrate that power dynamics can manifest themselves both constructively and non-constructively and, consequently, have a conducive or corrosive effect on intraprofessional learning (Chapter 3, 4, 5, and 6). Nonetheless, minimal attention has been given to power dynamics in medical education research<sup>30,31,36</sup>. As a result, power is underexposed when developing learning activities<sup>31</sup> and power dynamics are not openly addressed. We found that power distribution and interaction between primary care residents and medical specialty residents/supervisors are highly affected by underlying beliefs about professional norms or about other professions (Chapter 4). A powerful first step in managing the impact of power dynamics is by being aware of attitudes and beliefs.

Previous research has shown that status is conducive to legitimizing and gaining power<sup>37</sup>. Sometimes it seems to be a "status symbol" for higher-status professionals to disrespect the lower-status professionals<sup>16</sup>. This could be the case among physicians from different specialties<sup>13,29,38,39</sup>. Various studies, for example, have shown that residents from "another" specialty, such as primary care residents in hospitals, are viewed or treated as inferior<sup>39,40</sup> or even intimidated or harassed due to power supremacy by medical specialists and medical specialty residents during hospital placements<sup>33,34</sup>. As such, power dynamics can cause interpersonal and intraprofessional fear<sup>41</sup>. This undermines intraPC learning.

To be able to create a positive and safe learning climate for intraPC learning, it is important to openly address, understand and discuss the impact power dynamics on intraprofessional learning<sup>31,32</sup>. Our findings underscores this importance: medical specialists and residents



are often convinced that there are no power differences at play, (only cultural difference), but primary care physicians and residents explicitly mention that they regularly experience power differences between medical specialist and themselves (Chapter 6). To provide a solution for addressing power dynamics, one of the design principles formulates that supervisors and residents have to create a safe learning and working environment in which culture, equity and differences in work relations can be discussed (Chapter 6). This design principle also includes the recognition of historical patterns and feelings of differences in power and culture and opening these up for discussion. This design principle, together with a design principle about “building equal interpersonal relations founded on mutual respect and appreciation” and a design principle about “the patient as starting-point for working and learning” has been stated as a prerequisite to facilitate intraPC learning (Chapter 6).

### **Constructive power dynamics: practice what you preach**

Supervisors can play an important role in managing power dynamics and creating a culture of fearless intraPC learning (Chapters 3, 4 and 5). This requires supervisors to use their power in a benevolent manner and to be trustworthy. Power and trust are concepts that are empty in themselves, but they are filled with meaning depending on how they are used in concrete situations<sup>2</sup>. Both power dynamics and trust could create conditions that mobilize professionals to action and collaboration; when professionals feel “trust”, they are more likely to develop positive relationships and to collaborate effectively across the boundaries of specialties and hierarchies<sup>2</sup>. We show that positive power dynamics and a safe work culture can inspire and motivate residents to learn intraprofessionally (Chapters 3, 4 and 5).

However, we agree with Bhat & Godszmidt’s commentary on our Chapter 3, in which they state that important work is done by investigating factors in the learning of intraPC, but that the lack of intraPC (learning) may not be a problem that can be solved by education alone<sup>8</sup>. We demonstrate that intraPC (learning) is promoted when there is a collaborative work culture at the hospital department and when the entire supervising team demonstrate intraPC and reflect on their own performance as a team (Chapters 3 and 6). Practice what you preach by making the implicit explicit is a trustworthy and powerful way for residents to learn through role-modeling. However, not all supervisors or teams may yet have adopted intraPC themselves. In order to facilitate intraPC learning among residents, we call for an active role of the entire supervising team in continually training themselves in intraPC, based on the design principles (Chapter 6). This has been expressly formulated in design principle no. 8: “The training team engages explicitly in intraPC with the aim of delivering quality patient care and achieving continuous quality improvement”.

### **Designing intraprofessional learning**

With our design-based research, we sought to illuminate the residents' current development of intraPC competencies during hospital placements, to identify and describe the hindering factors and to empirically examine the facilitating factors for learning intraPC. Based on these findings, we aimed to provide evidence-based design principles for designing intraprofessional learning activities and interventions.

We found that out-of-specialty placements, such as hospital placements, have the potential to enhance learning that improves intraprofessional collaboration and attitudes towards other specialties and their patients. Hospital wards are very rich in opportunities for intraPC learning between primary care and medical specialty residents. Learning during out-of-specialty (hospital) placements, however, will be more advanced if attention is paid to the relevance, connection and transfer of the acquired knowledge to the residents' own or future specialty contexts. To take advantage of the abundant opportunities for mutually beneficial intraPC learning between primary care and medical specialty residents, adjustments in the design of out-of-specialty hospital placements are needed. Founded on our design-based research, twelve design principles have been developed, categorized into three clusters: Culture; Connecting Contexts; and Making the Implicit Explicit.

## **METHODOLOGICAL CONSIDERATIONS**

Our research methodology has several strengths. Firstly, our design-based research (Chapters 2-6) provides a demonstration of a method that we have used for approaching complex educational challenges to enhance collaboration between physicians. As such, the design principles themselves could be used to guide intraPC educational activities. Furthermore, the method of developing these principles could be used as a method for approaching complex educational challenges.

Another strength of our study is the use of several types of triangulation, such as: method triangulation, data source triangulation, investigator triangulation and research group triangulation. Particularly the combination of observations and interviews in our ethnographic study was a strength, allowing us not only to investigate people's conscious actions and intentions but also to observe their actual behavior and to further explore their unconscious behaviors and processes.

The data collection and analysis from both the individual studies and the entire design-based research was an iterative process. This proved to be important. During our ethnographic study, for example, we found that the theme of power dynamics came up

repeatedly in the interviews. As a result, we included additional questions in the subsequent interviews to explore this issue in greater depth.

Furthermore, we used COVID as an opportunity to learn lessons about the context in which intraPC learning can flourish. This helped us gain deeper insight into the role of context, culture and power dynamics and the role of supervisors in creating a safe intraPC learning environment.

The involvement of stakeholders, researchers and patients/caregivers during focus group sessions and work conferences is also strength. By working with stakeholders and patients/caregivers, we were able to verify that the design principles are feasible, attractive and user-friendly to those who have to work with them and to those who they are intended to benefit.

We also acknowledge some limitations. We only performed observations in locations where no patients were involved. A part of intraPC learning in the hospital may, therefore, have remained outside the scope of our ethnographic study. By involving residents, supervisors and patients/caregivers in our focus group sessions and work conferences, this limitation was reduced as much as possible.

Another limitation might be that power is a taboo subject. In our interviews, some residents and supervisors were very open about power struggles, while others were holding back. As our research had a broader scope than power dynamics alone, we may have missed depth or an opportunity to break through interviewees' hesitations.

Our design-based research study was conducted in the Netherlands with reference to the Dutch postgraduate training programs. Even though many countries operate similar hospital placement programs and settings, we did not uncover global principles. We do, however, argue that the design principles may be adapted in countries where the placement setting is somewhat different. Every postgraduate training program must, therefore, keep its own particularities in mind when implementing these design principles in its own setting and when evaluating their application.

## IMPLICATIONS FOR PRACTICE

Findings from this dissertation have a number of implications for future medical education/practice:

- The design of intraprofessional learning activities among residents during hospital placements should be a deliberate process in which the role of context, culture and power dynamics are carefully taken into account. Chapter 6 provides theory-driven and context-sensitive design principles focusing on Culture, Connecting Contexts and Making the Implicit Explicit. These design principles can be used as a guide to design intraprofessional learning activities and to guide the reflection and feedback cycles for assessing residents.
- Prototypes of intraprofessional learning activities based on the design principles are outlined in a workbook of intraprofessional learning activities. In September 2022, the Dutch Federation of Medical Specialists (FMS) will publish this workbook online in open access. Some learning activities have already been scientifically evaluated, while others are currently undergoing a scientific evaluation process. They are, however, evidence-informed and/or practice-informed. (See Chapter 8: Publications for the workbook with intraprofessional learning activities).
- Special attention should be given to the active role of the entire supervising team in intraPC and facilitating intraPC learning. It is preferable not only to develop and implement learning activities for residents based on design principles, but it is also vital for supervisors and supervising teams to continue to train themselves continuously in intraPC based on these principles.
- Finally, supervisors can play an important role in creating a safe work culture and in steering power dynamics to foster fearless intraPC learning. One important aspect here is to demonstrate psychological proximity by being easily approachable to residents to help them with questions, by explicitly inviting residents to ask questions, by being easy accessible for consultation and by being a role model in allowing themselves to be vulnerable and explicitly transparent about their own clinical uncertainties.

## FUTURE RESEARCH

- We would be interested in further research on the applicability of the design principles in educational practice to complement the design-based research approach. Our design principles were developed to guide the design of intraPC learning between primary care and medical specialty residents during hospital placements. However, these design principles could also be applied in other contexts. We recommend future

research to further evaluate the applicability of the design principles in other medical educational practices.

- We would recommend further research into managing and dealing with power dynamics in intraprofessional learning. We recommend, therefore, further investigation of the power dynamics at play in different medical education settings and what will help to improve fearless intraPC learning. We recommend triangulation with observations as this can be helpful in understanding what goes unmentioned in interviews.
- Future research should also focus on the role of supervisors in intraPC learning during out-of-specialty hospital placements. We would be interested in whether and how supervisors play their role in promoting intraPC learning during hospital placements and what kind of faculty development is needed.

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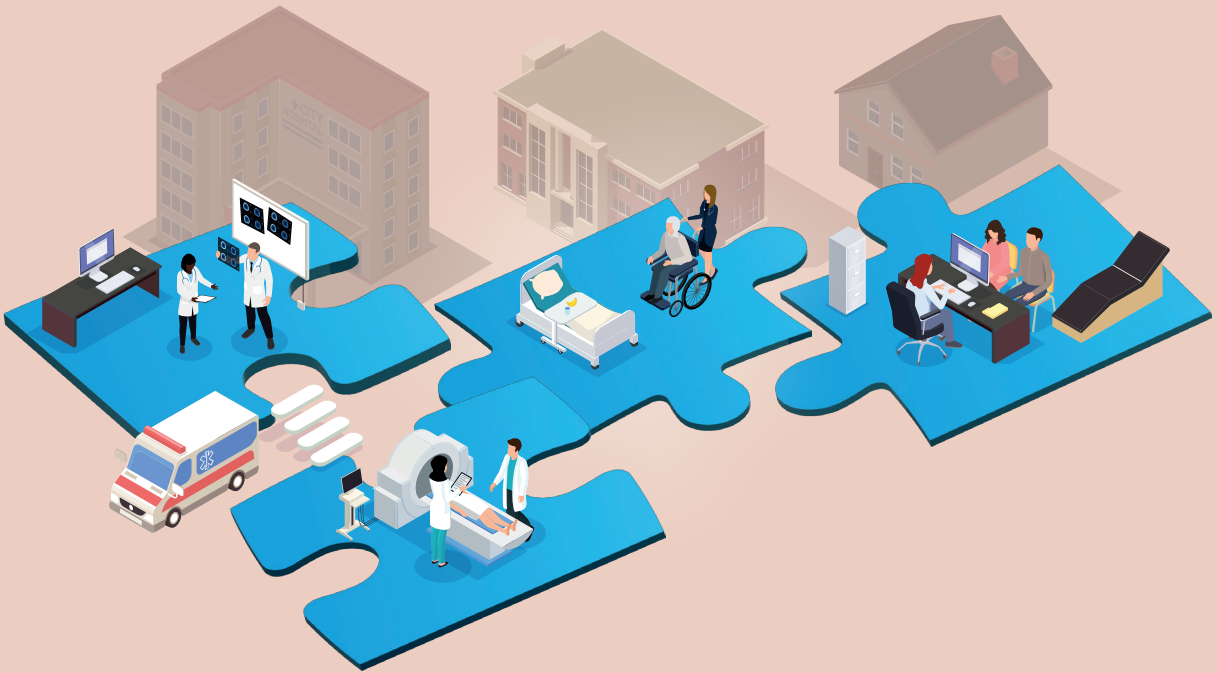




*“Let us make our  
future now,  
and let us make  
our dreams  
tomorrow’s  
reality.”*

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**Malala Yousafzai**



# CHAPTER 8

Appendices



## SUMMARY

Effective collaboration among physicians is becoming more and more important, but as such collaboration appears to be quite challenging, the learning of intraprofessional collaboration (intraPC), therefore, requires explicit attention. It would be preferable to start intraPC learning during postgraduate training in which residents are specializing as primary care physicians (e.g. family physician or elderly care physician) or as medical specialists. It is known what competencies primary care physicians and medical specialists need to acquire in order to be able to collaborate intraprofessionally; it is yet unknown whether and how intraprofessional collaborative competencies can be learned. Our intention was to identify and describe challenges and facilitators and provide guidance for intraPC learning among residents in training for primary care physicians and/or medical specialists.

**Chapter 1** is the introductory chapter of this thesis. It is known that the proximity of residents from different specialties in shared educational and clinical spaces, direct contact and sufficient time allocation are key for learning intraPC. The distance between primary care and medical specialty care, both as workplaces and as teaching environments, however, is a deeply-rooted obstacle to learning effective intraPC. Worldwide, it is common for primary care residents (PC residents) to spend several months (or years) of their training in the hospital. Most training programs for medical specialty residents (MS residents) also consist of placements in various hospital departments (out-of-specialty placements). During these placements, residents work with residents from other PC and MS specialties in close proximity at the same workplace and have the opportunity to learn intraPC. Medical workplaces, such as hospitals, are intensely hierarchical contexts in which intraprofessional hierarchies among medical specialties can be clearly recognized. Power dynamics based on traditional medical hierarchies are intrinsic to professional interaction and learning processes. Therefore, power dynamics may impact intraPC learning between PC and MS residents during hospital placements.

Evidence of the characteristics and the process of designing and developing educational activities, particularly aimed at intraPC learning during out-of-specialty hospital placements, is lacking. We conducted a design-based study to address these educational challenges and promote intraPC among PC residents and MS residents.

The overall goal of this research project was to illuminate current intraprofessional collaborative competency development during hospital placements and to uncover opportunities to stimulate the learning of intraPC by residents.

The three aims of this thesis were:

(i) to gain insight into the potential of hospital (out-of-specialty) placements for intraPC learning; (ii) to enhance our understanding of the context, culture and power dynamics on hospital wards and pave the way for future constructive collaborative learning and practice; (iii) to develop evidence-based recommendations for designing postgraduate out-of-specialty placements and design principles for intraPC learning among medical residents during hospital placements and to develop (prototypes of) intraprofessional learning activities.

In order to design intraprofessional learning among residents during out-of-specialty hospital placements, it is important to align the intraprofessional learning activities with the factors of out-of-specialty placements that contribute significantly to the professional development of residents. In **Chapter 2**, therefore, we conducted a literature study (scoping review) to identify the factors that are relevant for learning during out-of-specialty placements. Later on in the project, these would feed the development of evidence-based recommendations for designing these placements. We found that out-of-specialty placements have the potential to enhance learning that improves the expertise of residents in their own specialty such as medical competency, attitudes towards other specialties and their patients and inter-/intraprofessional collaboration. However, the learning opportunities available in these placements are commonly under-used. Learning during out-of-specialty placements can be optimized if residents and supervisors clearly understand both residents' specialty context and the placements' context, placement schedules provide exposure to experiences relevant for residents, supervision and feedback are tailored to the residents' educational needs and intraprofessional collaboration is explicitly addressed.

In **Chapter 3**, we investigated whether and how residents learn intraPC and what barriers and opportunities for intraPC learning exist during out-of-specialty hospital placements in the Netherlands. We conducted an ethnographic non-participatory observational study in three emergency departments and three geriatrics departments of five hospitals. The observations were followed by 42 in-depth interviews with the observed PC residents, MS residents and supervisors. We found that hospital placements provide tremendous opportunities for intraPC learning, but these opportunities are barely exploited. IntraPC is not learned spontaneously. It receives limited attention when formulating placement goals, and residents and supervisors lack awareness of intraPC learning opportunities. Additionally, MS residents are accustomed to teaching PC residents, but they are not accustomed to asking PC residents for their primary care expertise. On the other hand, PC residents often adjust to the role of MS residents and do not tend to share their primary care expertise. IntraPC learning is promoted when there is a collaborative culture with

limited hierarchy at the hospital department and when there is dedicated time for intraPC and support from supervisors.

The role of hierarchy and power dynamics in intraPC learning is explored in **Chapter 4**. Using template analysis, we analyzed the transcripts of observations and the in-depth interviews of Chapter 3 through the lens of hierarchy and power dynamics. We employed a critical theory paradigm, and discourse analysis additionally informed our data. Based on the data, we defined five interrelated themes that describe the characteristics of power dynamics in intraPC learning: beliefs, power distribution, interaction style, subjection and fearless learning. Power dynamics operate both within and between these themes. Beliefs about professional norms and about other professions appear to impact the distribution of power and the way PC residents, MS residents and supervisors interact with each other. When power distribution is based on inequity, it can lead to subjection of the PC residents, but when power distribution is based on equity, it can lead to fearless learning. Sincere and open interactions can enable fearless learning. Awareness and recognition of beliefs could be a first step in balancing power dynamics, followed by respectful interaction with careful language and actively inviting each other to participate in discussions.

**Chapter 5** describes the lessons we can learn from a pandemic context (COVID-19) in which intraPC can flourish. The COVID-19 pandemic emerged and caused a global health emergency with a huge influx of extremely ill patients, forcing hospitals to establish new COVID and ICU units where many physicians and residents from different specialties had to work together in the same workplace. Working at an ICU or COVID department may be considered as a special form of out-of-specialty placement for residents and supervisors. We conducted sixteen semi-structured interviews with residents and medical specialists from various specialties who worked at a COVID or ICU unit during the COVID pandemic in the Netherlands. This study shows that collaboration under pressure with a shared lack of knowledge of COVID-19 contributes to a high degree of social cohesion and limited hierarchy between specialties and between supervisors and residents. During the COVID crisis, the distribution of roles and responsibilities was functional and based on equity. Supervisors demonstrated a high level of psychological proximity, as they repeatedly instructed residents to approach them with questions and they were explicitly transparent about their own clinical uncertainties. This psychological proximity appeared to be a crucial factor contributing to a safe working/learning climate. The combination of collective uncertainty, social cohesion, psychological proximity and the presence of different specialties in one department can empower residents' fearless intraPC learning.

Based on our findings in Chapters 2 to 5, we defined nine theory-driven design principles. **Chapter 6** reports on the refinement of this series of educational design principles for postgraduate training with a focus on enhancing intraPC between primary care and



medical specialty residents. This chapter demonstrates a method for approaching complex educational challenges. The nine design principles were presented in three focus groups and two work conferences with stakeholders, researchers and patients/caregivers. The result was a polished set of twelve principles nested within three clusters: 1) Culture: building collaborative relations based on equity in a psychologically safe context where patterns or feelings of power dynamics between primary care and medical specialty physicians can be discussed; 2) Connecting Contexts: connecting and aligning primary and specialty care by making residents and supervisors mutually share and understand each other's work contexts and activities; and 3) Making the Implicit Explicit: consciously addressing intraPC in learning objectives, assessments and during work activities by having supervising teams act as role models demonstrating intraPC and continuously pursuing improvement in intraPC to make intraPC explicit. The design of intraPC learning activities between medical residents is ideally a deliberate process in which a distinct focus on culture is a prerequisite to facilitate intraPC learning.

**Chapter 7** is the general discussion of this thesis. IntraPC during postgraduate workplace learning sets the tone for the quality of future intraPC. Our findings show that the Empowerment of Residents for Intraprofessional Collaboration goes beyond developing new skills and competencies: it is a matter of creating a culture of sincere equal collaboration and constructive power dynamics for fearless intraPC (learning). The roles of Context, Culture and Power Dynamics are interacting and have a direct impact on intraPC learning. A deeper understanding of the role of Context, Culture and Power Dynamics and how we can manage and guide them is helpful and necessary to further improve intraPC. Founded on our design-based research, twelve design principles have been developed, categorized into three clusters: *Culture*; *Connecting Contexts*; and *Making the Implicit Explicit*. The design principles in these clusters help to manage Context, Culture, and Power Dynamics with the overall goal of achieving good intraprofessional collaboration.

For learning during out-of-specialty hospital placements to be optimal, residents' original professional training context and the placements' context should be united. Also primary and medical specialty care should be connected and aligned by mutual learning and collaboration between primary care and medical specialty residents and supervisors (**Context**). This is covered by the design-principles cluster *Connecting Contexts*. Hospitals and residency training have a deep-rooted hierarchical nature (**Culture**). A certain degree of hierarchal power distribution is necessary for a functional division of roles and responsibilities and for fostering a work culture that contributes to fearless intraPC learning. Unconstructive **Power Dynamics**, however, demotivate residents and have a corrosive effect on intraprofessional learning. The impact of power dynamics on intraPC learning needs to be openly addressed, understood and discussed. This could be achieved by applying the design-principles of cluster *Culture*. Supervisors play an important

role in creating an optimal **context, culture** and **power dynamics** for the empowerment of residents for intraprofessional collaboration. This requires supervisors to use their power in a benevolent manner and to be psychologically proximate, and it requires the entire supervising teams to continually train themselves in intraPC, based on the design principles. This is covered in the design-principles cluster *Making the Implicit Explicit*. The series of twelve design principles form a firm base to guide intraPC learning.

## NEDERLANDSE SAMENVATTING

Effectieve samenwerking tussen artsen van verschillende specialismen wordt steeds belangrijker, maar blijkt vooralsnog een flinke uitdaging te zijn. Daarom behoeft het leren van intraprofessionele samenwerking (intraPS) expliciete aandacht, bij voorkeur al tijdens de medische vervolgopleidingen waarin artsen in opleiding tot specialist (aios) zich specialiseren tot eerstelijns geneeskundig specialist (huisarts of specialist ouderengeneeskunde) of tot tweedelijns geneeskundig specialist (medisch specialist). Uit onderzoek is bekend welke competenties eerste- en tweedelijns specialisten moeten verwerven om intraprofessioneel te kunnen samenwerken; maar het is nog onbekend of en hoe intraPS-competenties (kunnen) worden geleerd. Het was daarom onze ambitie om faciliterende en belemmerende factoren te identificeren en te beschrijven en richtlijnen te geven voor hoe eerste- en tweedelijns aios goed kunnen (leren) samenwerken.

**Hoofdstuk 1** is de inleiding van dit proefschrift. Uit eerder onderzoek is gebleken dat voor het leren van intraPS diverse factoren een rol spelen, bijvoorbeeld dat aios van verschillende specialismen in gedeelde onderwijs- en klinische ruimten bij elkaar zijn, direct onderling contact hebben en voldoende geoormerkte tijd hebben voor intraPS. Echter, de afstand tussen eerstelijns- en tweedelijns specialistische zorg, zowel qua werkplek als onderwijsomgeving, vormt een fundamentele belemmering voor het leren van effectieve intraPS. Het is wereldwijd gebruikelijk dat eerstelijns aios een deel van hun opleiding (maanden of jaren) in het ziekenhuis stagelopen. De meeste opleidings-programma's voor medisch specialistische aios bevatten ook stages bij andere specialismen op verschillende ziekenhuisafdelingen ('out-of-specialty' stages). Aangezien aios, tijdens deze stages, samen met aiossen van andere eerste- en tweedelijns specialismen op dezelfde werkplek werken, hebben zij de mogelijkheid om intraPS te leren. Medische werkplekken, zoals ziekenhuizen, zijn hiërarchische contexten waarin duidelijke hiërarchie herkenbaar is tussen medische specialismen. Machtsdynamiek gebaseerd op deze traditionele medische hiërarchie is inherent aan professionele interactie en leerprocessen. Daarom zou machtsdynamiek van invloed kunnen zijn op het leren van intraPS tussen eerste- en tweedelijns aios tijdens ziekenhuisstages.

Er is nauwelijks informatie over het ontwerpproces en -kenmerken van onderwijsactiviteiten gericht op het leren van intraPS tijdens 'out-of-specialty' stages. Wij hebben daarom een design-based studie uitgevoerd om ontwerpprincipes te ontwikkelen voor het leren van intraPS tussen eerste- en tweedelijns aios.

Het overkoepelende doel van dit onderzoeksproject was om de huidige ontwikkeling van intraprofessionele samenwerkingscompetenties tijdens ziekenhuisstages te onderzoeken

en om mogelijkheden te ontdekken om het leren van intraPS tussen eerste- en tweedelijns aios te stimuleren.

De drie doelstellingen van dit proefschrift waren:

(i) inzicht verwerven in het potentieel van ('out-of-specialty') ziekenhuisstages voor het leren van intraPS; (ii) ons begrip van de context, cultuur en machtsdynamiek op ziekenhuisafdelingen vergroten en de weg vrijmaken voor toekomstig constructief (leren) samenwerken; (iii) evidence-based aanbevelingen ontwikkelen voor het ontwerpen van 'out-of-specialty' stages en ontwerpprincipes voor het leren van intraPS tussen aios tijdens ziekenhuisstages en (prototypes van) intraprofessionele leeractiviteiten ontwikkelen.

Voor de ontwikkeling van intraPS tussen aios tijdens een out-of-specialty stage, is het belangrijk om zicht te hebben op en aan te sluiten bij de factoren van deze stages die bijdragen aan de professionele ontwikkeling van aios. In **Hoofdstuk 2** hebben we daarom een literatuurstudie (scoping review) uitgevoerd om de factoren te identificeren die relevant zijn voor het leren tijdens een 'out-of-specialty' stage. Later in het project vormen deze factoren de basis voor de ontwikkeling van evidence-based aanbevelingen voor het vormgeven van deze stages. We concludeerden dat 'out-of-specialty' stages het potentieel hebben om de expertiseontwikkeling van aios te bevorderen ten behoeve van hun eigen specialisme, zoals medische competentie, attitudes ten opzichte van andere specialismen en hun patiënten en inter-/intraprofessionele samenwerking. De leermogelijkheden die deze stages bieden, worden echter over het algemeen onvoldoende benut. Leren tijdens 'out-of-specialty' stages kan geoptimaliseerd worden als: (i) aios en supervisors duidelijk de contexten kennen van en begrip hebben voor zowel het specialisme van aios als de context van de out-of-specialty stage, (ii) de stage ervaringen biedt die relevant zijn voor de betreffende aios, (iii) supervisie en feedback afgestemd zijn op de onderwijsbehoeften van aios en (iv) intraprofessionele samenwerking expliciet aan bod komt.

In **Hoofdstuk 3** hebben we onderzocht in hoeverre en hoe aios intraprofessioneel leren en welke barrières en mogelijkheden er zijn voor het leren van intraPS tijdens 'out-of-specialty' stages in Nederlandse ziekenhuizen. We hebben een etnografisch niet-participerend observationeel onderzoek uitgevoerd op drie spoed eisende hulp-afdelingen en drie geriatrie-afdelingen van vijf ziekenhuizen. De observaties werden gevolgd door 42 diepte-interviews met de geobserveerde eerstelijns aios, tweedelijns aios en supervisors. We ontdekten dat ziekenhuisstages ruime mogelijkheden bieden voor het leren van intraPS, maar dat deze mogelijkheden nauwelijks worden benut. IntraPS wordt niet spontaan geleerd. Het krijgt weinig aandacht bij het formuleren van de stageleerdoelen, en aios en supervisors zijn zich nauwelijks bewust van de intraPS leermogelijkheden op de werkplek. Bovendien zijn tweedelijns aios gewend om eerstelijns aios te onderwijzen, maar ze zijn niet gewend om hen te vragen naar hun eerstelijns expertise. Aan de andere

kant stappen eerstelijns aios vaak in de rol van tweedelijns aios en zijn ze niet geneigd hun eerstelijns expertise te delen. Het leren van intraPS wordt bevorderd wanneer er een samenwerkingscultuur is met beperkte hiërarchie op de ziekenhuisafdeling en wanneer er geormeerde tijd is voor intraPS en ondersteuning van supervisors.

De rol van hiërarchie en machtsdynamiek in intraPS wordt onderzocht in **Hoofdstuk 4**. Met behulp van template analyse hebben we de transcripten van de observaties en de diepte-interviews van hoofdstuk 3 geanalyseerd door de lens van hiërarchie en machtsdynamiek. We gebruikten hierbij 'kritische theorie' als paradigma. Discoursanalyse leverde aanvullende informatie over onze gegevens. Op basis van de data hebben we vijf thema's gedefinieerd die de kenmerken van machtsdynamiek in het leren van intraPS beschrijven: overtuigingen, machtsverdeling, interactiestijl, onderworpenheid en veilig leren. Deze thema's zijn onderling gerelateerd en de machtsdynamiek werkt zowel binnen als tussen deze thema's. Overtuigingen over professionele normen en over andere professies blijken van invloed te zijn op de verdeling van macht en de manier waarop eerstelijns aios, tweedelijns aios en supervisors met elkaar omgaan. Wanneer de machtsverdeling gebaseerd is op ongelijkheid, kan dit leiden tot terugtrekking/onderwerping van de eerstelijns aios, maar wanneer de machtsverdeling gebaseerd is op evenwaardigheid, kan dit leiden tot veilig leren. Met oprechte en open interacties is het mogelijk om een veilige leeromgeving te creëren voor het leren van intraPS. Een eerste stap om machtsdynamieken in evenwicht te brengen is bewust worden en erkennen van je overtuigingen en attitude, gevolgd door respectvolle interactie met aandachtig taalgebruik (verbaal en non-verbaal) en elkaar actief uitnodigen voor deelname aan discussies.

**Hoofdstuk 5** beschrijft de lessen die we kunnen leren van een crisis context (COVID-19) waarin intraPS ineens floreerde. De COVID-19 pandemie veroorzaakte een wereldwijde gezondheids crisis met een enorme toestroom van zeer zieke patiënten. Hierdoor werden ziekenhuizen gedwongen om nieuwe COVID en intensive care (IC) afdelingen op te zetten waar veel aios en artsen van verschillende specialismen moesten samenwerken op één werkplek. Werken op een IC of COVID-afdeling kan beschouwd worden als een speciale vorm van 'out-of-specialty' stage voor aios en supervisors. Wij hielden zestien semigestructureerde interviews met aios en medisch specialisten van verschillende specialismen die op een COVID- of ICU-afdeling werkten tijdens de COVID-pandemie in Nederland. Deze studie laat zien dat '(samen)werken onder druk' waarbij iedereen een gebrek aan kennis heeft over COVID-19, bijdraagt aan een hoge mate van sociale cohesie en veel minder hiërarchie tussen specialismen en tussen supervisors en aios. Tijdens de COVID-crisis was de verdeling van rollen en verantwoordelijkheden functioneel en gebaseerd op evenwaardigheid. Supervisors toonden een hoge mate van psychologische nabijheid, doordat zij de aios herhaaldelijk uitnodigden om hen te benaderen met vragen en zij transparant waren over hun eigen klinische onzekerheid met betrekking tot COVID-

patiënten. Deze psychologische nabijheid bleek een cruciale factor te zijn die bijdroeg aan een veilig werk-/leerklimaat. De combinatie van collectieve onzekerheid, sociale cohesie, psychologische nabijheid en de aanwezigheid van verschillende specialismen op één afdeling bevorderde het veilig intraPS-leren door aios.

Op basis van onze bevindingen in de hoofdstukken 2 t/m 5, hebben we een reeks van negen educatieve ontwerpprincipes gedefinieerd. **Hoofdstuk 6** beschrijft de verfijning en uitbreiding van deze ontwerpprincipes. De negen ontwerpprincipes werden gepresenteerd in drie focusgroepen en twee werkconferenties met eerste- en tweedelijns aios en specialisten, onderwijskundigen, onderzoekers en patiënten/mantelzorgers. Het resultaat is een zorgvuldig ontwikkelde set van twaalf ontwerpprincipes, gecategoriseerd in drie clusters: 1) Cultuur: het opbouwen van samenwerkingsrelaties gebaseerd op evenwaardigheid in een psychologisch veilige context waar patronen of gevoelens van cultuur- en machtsverschillen tussen eerstelijns artsen en medisch specialisten besproken kunnen worden; 2) Contexten Verbinden: het verbinden en op elkaar afstemmen van eerstelijns- en tweedelijns specialistische zorg door aios en supervisors elkaars werkcontexten en activiteiten te laten delen en leren kennen; en 3) Het Impliciete Expliciet Maken: het bewust aan de orde stellen van intraPS in leerdoelen, beoordelingen en tijdens werkactiviteiten door superviserende teams te laten optreden als rolmodellen die intraPS demonstreren en voortdurend streven naar verbetering in intraPS. Gebaseerd op deze ontwerpprincipes kunnen intraPS leeractiviteiten ontwikkeld worden. Het ontwerpen van intraPS leeractiviteiten tussen aios is idealiter een weloverwogen proces waarin een duidelijke focus op Cultuur een vereiste is om het leren van intraPS te kunnen faciliteren.

**Hoofdstuk 7** is de algemene discussie van dit proefschrift. IntraPS tijdens werkplekleren in de medische vervolgopleiding zet de toon voor de kwaliteit van intraPS tussen eerste en tweedelijns specialisten ten behoeve van persoonsgerichte zorg. Onze bevindingen laten zien dat de *Empowerment van aios voor Intra PS* verder gaat dan het ontwikkelen van nieuwe vaardigheden en competenties: het gaat om het creëren van een Cultuur van oprechte, evenwaardige samenwerking en constructieve Machtsdynamiek voor het veilig leren van intraPS binnen de Context.

Om optimaal te kunnen leren tijdens out-of-specialty stages in ziekenhuizen, moeten de oorspronkelijke context van het specialisme van de aios en de context van de stages met elkaar verbonden worden. Tevens moeten eerstelijns- en tweedelijns zorg op elkaar afgestemd zijn door wederzijds leren en samenwerken tussen eerste- en tweedelijns lijns en supervisors (**Context**). Dit wordt behandeld in het ontwerp-principes cluster *Contexten Verbinden*. Ziekenhuizen en medische opleidingen hebben een diepgewortelde hiërarchische karakter (**Cultuur**). Een zekere mate van hiërarchische machtsverdeling is noodzakelijk voor een functionele verdeling van rollen en verantwoordelijkheden en

voor het genereren van een veilige leer-/werkcultuur. Niet-constructieve machtsdynamiek demotiveert de aios echter en heeft een ondermijnend effect op intraprofessioneel leren. De impact van **Machtsdynamiek** op het leren van intraPS moet daarom openlijk aan de orde gesteld, begrepen en besproken worden. Dit zou bereikt kunnen worden met de ontwerp-principes van het cluster *Cultuur*. Supervisoren spelen een belangrijke rol in het creëren van een optimale **context, cultuur** en **machtsdynamiek** voor de empowerment van aios voor intraprofessionele samenwerking. Dit vraagt van supervisoren dat ze hun macht op een constructieve manier gebruiken en dat ze psychologisch nabij zijn, en het vraagt van het hele superviserende team dat ze zichzelf voortdurend trainen in intraPS, gebaseerd op de ontwerpprincipes. Dit wordt behandeld in het ontwerp-principes cluster *Het impliciete Expliciet Maken*. De serie van twaalf ontwerpprincipes vormen een stevige leidraad voor het leren van intraPS.

## DATA MANAGEMENT STATEMENT

All studies in this dissertation were conducted in accordance with the principles of the Declaration of Helsinki. Participation in the studies was voluntary and written informed consent was obtained from all participants included in the studies. Original data were treated confidentially.

The Ethical Review Board of the Netherlands Association of Medical Education has reviewed and approved the studies in Chapter 3, 4, 5 and 6. For chapter 2 (literature study), an ethical approval was not required.

The in-depth interviews and focus group interviews in Chapter 3, 4, 5 and 6 were recorded using a voice recorder. The audio files of Chapter 3, 4 and 6 have been stored at Radboudumc department server H:\ELG\OZ-onderzoek-van- onderwijs\OO-SPICE  
The audio files of Chapter 5 have been stored at Radboudumc Health Academy server \\umcms016.umcn.nl\rha\$\Corona\Data

After storage, the files have immediately been deleted from the voice recorder. The audio files were transcribed by a professional transcription agency: teksuitschrijven.nl Data were pseudonymized by replacing all names by PC-resident no., MS residents no. or supervisor no. and by replacing the names of the hospitals by initials of two letters. The transcripts have been captured in Atlas.Ti in order to analyze qualitative data. This program is stored and backed-up at the local Radboudumc server. The analyzed data files of Chapter 3, 4 and 6 have been stored at the Radboudumc department server H:\ELG\OZ-onderzoek-van- onderwijs\OO-SPICE. The analyzed data files of Chapter 5 have been stored at the Radboudumc Health Academy server \\umcms016.umcn.nl\rha\$\Corona\Data  
Both servers have automatic daily back up.

For studies in Chapter 3, 4, 5 and 6, written informed consent has been obtained from the participants. These files are stored at the Radboudumc department server H:\ELG\OZ-Sleutelbestanden\OO-SPICE (Chapter 3, 4, 6) and at the Radboudumc Health Academy server \\umcms016.umcn.nl\rha\$\Corona\NAWgegevens (Chapter 5). Only the main researchers have access to these files.

Data will be saved for 15 years after termination of the last study (February 2022). The datasets from the studies are available from the corresponding author on reasonable request.



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De manuscriptcommissie professor Yvonne Schoon, professor Esther Tanck en doctor Loes van Bokhoven, dank jullie wel voor de tijd en energie die jullie hebben besteed aan het lezen en beoordelen van dit proefschrift.

Maroeska, dankjewel dat je mijn mentor wilde zijn. Het was fijn en inspirerend om jaarlijks met je te reflecteren op mijn proces en te mogen leren van jouw enorme professionele ervaring. Ik voelde me erg door jou gesteund op de momenten dat het even moeilijk was. Je bent een top mentor.

Aan de afzonderlijke studies van dit onderzoeksproject hebben diverse co-onderzoekers meegewerkt. Ik wil jullie allen bedanken voor jullie input en de samenwerking. Een paar mensen wil ik nog even nader noemen:

Esther, bedankt dat je me hebt gestimuleerd om een etnografisch onderzoek uit te voeren, ik heb enorm van deze onderzoeksmethode genoten! Ook je altijd gedegen en krachtige

feedback heb ik erg gewaardeerd, hierdoor werden de papers altijd weer naar een hoger niveau getild. Bart, dankjewel voor het helpen concreet maken van de 'why' van dit onderzoeksproject en het kritisch meewerken en-lezen aan een aantal studies. Het sparren met jou vond ik altijd inspirerend. Tamara, ik vond het een feestje om samen met jou de power dynamics te mogen analyseren. Jouw filosofische perspectief, enthousiasme en flexibiliteit heb ik zeer gewaardeerd. Dieneke, dankjewel voor je drive om intraprofessioneel onderzoek steeds weer te verfijnen en te verdiepen, onder meer door vervolgstudies te ontwikkelen. Onze persoonlijke gesprekken, bijvoorbeeld toen ik in korte tijd meerdere dierbaren had verloren, vond ik bijzonder fijn en steunend. Daarnaast was het samen lachen lekker energie-gevend. Lotte, Rozemarijn en Wietske, wat geweldig dat jullie het 'momentum' van de Covid-pandemie met ons hebben aangegrepen om lessen te kunnen leren voor intraprofessioneel werken buiten crisis. Ik heb onze samenwerking en discussies erg gewaardeerd. Mariëlle en Lonneke, ik vond jullie enthousiaste en tevens kritische visie als jonge professionals heerlijk verfrissend. Wat fijn en gezellig dat jullie na je wetenschappelijke stage nog een tijdje aan dit onderzoeksproject verbonden zijn gebleven. En Mariëlle, extra dank voor het 'in beeld' brengen van onze onderzoeksresultaten, de foto's zijn nog steeds nuttig!

De afdeling geriatrie van Radboudumc, bedankt voor jullie bereidwilligheid om mee te werken aan (vervolg)onderzoek, zoals het uitzetten en wetenschappelijk evalueren van de TILS module. Ik waardeer jullie gastvrijheid om steeds weer te mogen komen observeren en interviewen. Ik wil in het bijzonder Dieneke, Maarten en Elselien bedanken voor de ontwikkeling en uitvoer van de TILS module en voor het samen onderzoeken van het effect van deze module.

Mijn collega's van de afdeling eerstelijns geneeskunde, bedankt voor de energieke samenwerking, het delen van jullie praktijkvoorbeelden, alle interesse die jullie toonden in het onderzoek en het meewerken aan verschillende studies. Elselien, Rosalin, Rolina, Anneke, Margien en Maggitte, ik vond het geweldig om samen met jullie wetenschappelijke data te verwerken in praktisch interprofessioneel onderwijs. Linda, voor jou een speciaal dankjewel voor het figureren op de onderzoek foto's en hiermee laten zien dat wetenschap ook ruimte heeft voor humor.

Mijn mede-PhD's, dank jullie wel voor de 'promovendi community', het leren van elkaar en samen sparren over vraagstukken. Ria, Elske, Margot en Marijn, ik heb er van genoten om samen met jullie een PhD-cursus te volgen en/of gezamenlijke sessies te verzorgen op congressen. Ik hoop dat we daar na onze promotie gewoon mee doorgaan!

Natuurlijk had dit onderzoek er nooit kunnen zijn zonder medewerking van de deelnemers en ziekenhuisafdelingen. Ik wil de zes ziekenhuisafdelingen hartelijk bedanken voor de

medewerking en de gastvrijheid dat ik daar observaties en interviews heb mogen uitvoeren. Tevens wil ik alle bij de medische (eerste- of tweedelijns) vervolgoopleidingen betrokken aios, supervisors/opleiders, docenten, onderwijskundigen, beleidsmakers, onderzoekers, patiënten en mantelzorgers die hebben meegewerkt aan onze observaties, interviews, focusgroepen en/of werkconferenties speciaal bedanken voor hun tijd, energie en vooral voor hun openheid! Ik heb al die momenten en ontmoetingen als enorm inspirerend ervaren.

De Federatie Medisch Specialisten werkgroep Opleiden 2025, bedankt voor de aangename samenwerking die altijd heel gedreven en professioneel verliep. Marieke B, dankjewel voor je gepassioneerde inzet en innovatieve ideeën rondom onderzoek naar intraprofessioneel leren samenwerken tijdens Covid. Onze overeenstemmende ideeën en enthousiasme (!) maakte ons een goed team en leidde tot een mooi onderzoek in samenwerking tussen Radboudumc en FMS. Arno en Angelique, bedankt voor het opzetten en vormgeven van de webinar over interprofessioneel samenwerken, ik vond het heel prettig om met jullie samen te werken en wat zijn jullie een professioneel team! Marieke H, Auk en Ramon, het was top om met jullie samen een bundel met werkvormen voor intraprofessioneel opleiden te maken. Jullie hebben echt een scherp oog voor alles en wat ziet het er prachtig uit! Linda, dank je wel dat je de ontwikkeling van dit boek zo vloeiend hebt gecoördineerd. Jouw werkwijze is heel accuraat en ik vond het heerlijk om met zo'n positief en enthousiast persoon te mogen samenwerken. Uiteraard dank ik ook alle auteurs die de werkvormen hebben ontwikkeld en bereid waren dit belangeloos te delen via deze werkvormen bundel. Jullie zijn geweldig! Iedereen die 'achter de schermen' heeft meegewerkt aan deze uitgave, wil ik ook enorm bedanken. En last but not least Dieneke, veel dank dat je samen met mij de inhoudelijke redactie hebt gedaan.

Ik wil alle leden van de NVMO werkgroep IPE&C bedanken voor de bevlogen samenwerking om interprofessioneel leren samenwerken op de kaart te zetten. Het is prachtig om te ervaren hoeveel wetenschappelijke en praktijk expertise er werd uitgewisseld in deze werkgroep. Een speciaal dankjewel gaat uit naar Marjon met wie ik de afgelopen 2,5 jaar samen voorzitter mocht zijn van deze werkgroep. Samenwerken met jou voelt eigenlijk niet echt als 'werken', omdat alles zo aangenaam soepel en natuurlijk verloopt en daarnaast kunnen we heerlijk samen lachen.

De medewerkers van SOON, in het bijzonder Corinne, Kristin en Babette, dank ik voor de jarenlange samenwerking en jullie oprechte interesse in het onderzoek. Ik vind het altijd leuk om bij jullie in Schola Medica te zijn, samenwerken met jullie levert me altijd een positief humeur op.

De collega's van de vakgroep klinische psychologie aan de RU, in het bijzonder Iris, bedankt dat ik elk jaar weer een aantal weken 'terug naar mijn roots' mag gaan door het verzorgen van klinisch vaardigheidsonderwijs. En nu blijken onze wegen zich op onderzoeksgebied wellicht ook nog te gaan kruisen.

Ik wil het team en de samenwerkpartners van Battal & Looman enorm bedanken voor de teamspirit en betrokkenheid, de gedreven samenwerking en de enorme humor. Ik geniet van de mooie balans tussen serieus werken en samen heel hard kunnen lachen, dat maakt de onderlinge verbinding zo krachtig en gezond. De afgelopen periode was ik er niet zoveel omdat ik in een PhD-cocon zat, en dat kon alleen dankzij jullie begrip en flexibiliteit, dank jullie wel.

Een aantal jaren terug in de tijd: de universiteit van Tilburg. Carrie, dankjewel voor jouw positiviteit, je energie en je vertrouwen in mij. Je hebt me gestimuleerd, gesteund en uitgedaagd om me verder te ontwikkelen. Bij mijn afscheid zei je "het is niet de vraag of Natasja gaat promoveren, het is de vraag *wanneer* ze dat gaat doen". Het is nu zo ver Carrie!

Mijn vrienden en stalgenoten, dank jullie wel voor het oprechte samen-zijn, de eerlijke en diepzinnige gesprekken, 'samen lachen en samen huilen', de gezellige etentjes, en de leuke ontspannende activiteiten, zoals paardrijden, Run-Cook-Eat activiteiten, etentjes en borrels bij de vuurkorf, en natuurlijk 'nieuwe dingen uitproberen!' Het heeft niets met onderzoek te maken en is daarom des te belangrijker! Ik ben dankbaar voor jullie vriendschap.

Mijn paranimfen, Noël en Nicole. Jullie zijn een gouden duo, staan altijd achter me, zijn altijd enthousiast, helpen me enerzijds om te relativeren – al is het maar omdat jullie zelf tamelijk chaotisch zijn ;) – en anderzijds om naar mijn gevoel te luisteren. Samen zijn met jullie is altijd vertrouwd en bruisend.

Tot slot wil ik mijn familie bedanken voor hun liefde en steun. Lieve tante Lies, familie oudste, bedankt voor je enorme levenslust, je geeft me een positief voorbeeld van hoe je oud(er) kunt worden. Lieve Harald en Lizette, 'brother' en 'sister', bedankt voor jullie liefdevolle aandacht en dat jullie er altijd voor me zijn. Lieve Angelique, dankjewel voor je betrokkenheid en heerlijk dat wij samen altijd wel 'iets gek's' meemaken. Lieve tante Gatitie, dankjewel voor je positieve energie en de vele mooie wijze woorden die altijd ondersteunend zijn.

Lieve Bianca, mijn zus, van kindsbeen zijn we heel verschillend en lijken we een soort yin en yang. Jij als kunstenaar inspireert mij om de behoefte aan wetenschappelijke of logische rede af en toe te laten varen en ruimte te maken voor een beeld zonder al teveel

woordelijke invulling. Dankjewel voor jouw filosofische perspectief op de wereld en de prachtige beelden die je maakt. Ik word er stil van.

Lieve papa, ik vind het ontzettend jammer dat je niet bij mijn promotie kunt zijn, ook omdat ik weet hoe trots en blij je was dat ik dit promotieonderzoek was gaan doen. Jouw plotselinge overlijden was de belichaming van mijn promotie onderwerp, maar dan helaas in de versie hoe het niet moet. Het was een uiterst pijnlijke les. Liever denk ik aan de mooie lessen die je me bewust of onbewust leerde. Je was bijvoorbeeld dol op winkelen en nam mijn zus en mij (10 en 8) vaak mee. Je had de gewoonte om midden in de stad onze handjes vast te pakken en met ons te gaan huppelen. Als mensen ons dan aanstaarden zei je lachend “soms moet je je niets aantrekken van wat andere mensen denken en gewoon je eigen impuls volgen!” Toen ik later psychologie studeerde realiseerde ik me dat dit een vorm van ‘systematische desensitisatie’ was. Nog regelmatig, als ik een presentatie moet geven en twijfel ‘zou ik dit wel doen?’, hoor ik je in mijn oor “Soms...!”. Dank je wel pap.

Lieve mama, als ik vroeger iets had gedaan, wist jij dat al voordat ik door de deur naar binnen was gelopen. “Moeders weten alles” zei je dan. Ik vond dat razend fascinerend, vooral toen later ook nog eens bleek dat jouw voorgevoel vaak klopte. Van jou heb ik geleerd om altijd eerlijk te zijn. Toen ik druk doende was met het schrijven van mijn proefschrift, heb je in onze tuin bij de plek waar ik vaak pauze houd, allemaal mooie rozen gepland als verassing, superlief! Dank je wel mam.

Last, but absolutely not least: Lieve Noël, woorden schieten tekort om te beschrijven hoe belangrijk je voor mij bent en wat je voor mij betekent. Dus alles wat ik hier schrijf dekt eigenlijk niet de lading. Ik prijs me ontzettend gelukkig dat ik mijn leven met jou mag delen. Jij bent zo’n mooie pure (en grappige!) ziel en je maakt mijn leven mooi, kleurrijk en compleet. Zonder jouw onvoorwaardelijke liefde was dit promotietraject niet gelukt. Je bent spiritueel zeer begaafd, waardoor je de informatiebronnen benut die veel verder reiken dan wat we met onze zintuigen en onze rationele geest kunnen ‘zien’ en bevatten. In moeilijke tijden was je daarom niet alleen mijn steun en toeverlaat, maar ook mijn guide. Van jou heb ik onder andere geleerd om naar mijn intuïtie te luisteren en die wijsheid ook toe te passen. Je hebt ook nog eens achter de schermen met alle artikelen meegelezen, en als ik even vastliep, kwam jij met geweldige feedback en ideeën. Eigenlijk zou je een co-auteurschap hebben verdiend. Over een paar maanden is het jouw beurt, dan ga jij promoveren en ben ik jouw paranimf! Ik hou van je.

## **CURRICULUM VITAE**

Natasja Looman completed her Athenaeum (pre-university education) and in the same year she pursued studying pharmacy at the University of Groningen. After a year, she switched to studying clinical psychology and continued this study at the Radboud University Nijmegen. She pursued other academic interests such as governance, and university politics by participating in committees and the executive board of a student association. After graduating as a psychologist, she became a specialist in stress, anxiety and trauma treatment and completed several postgraduate training programs, including cognitive behavioural therapy, mindfulness based cognitive therapy, energy psychology and hypnotherapy.

After graduating as psychologist, she started her professional career as behavioural science teacher and psychologist (for students) at the Radboud University Nijmegen and Tilburg University (2000-2014). In addition, in 2005 she also co-founded a psychology practice (Battal & Looman) that since 2022 has become an academy for psychology and hypnotherapy. Natasja is one of the directors of this company. In 2014, she started to combine her clinical work with teaching and education development at the department of Primary and Community Care of Radboud University Medical Center (Radboudumc) and the department of Clinical Psychology at the Radboud University Nijmegen. At Radboudumc, she was promoted to project manager of interprofessional education (2017) and she started her PhD trajectory in 2018. Although she conducted her PhD part-time (20 hours per week), she completed her PhD project within four years.

Next to publishing articles, supervising junior researchers and teachers, reviewing and presenting, she was the co-chair of the working group Interprofessional Education & Collaboration of the Netherlands Association for Medical Education. Additionally, she developed new education materials about power dynamics in medical education and -practice and she co-developed a workbook for interprofessional education for postgraduate medical specialty training. In 2021, the Netherlands Association for Medical Education nominated her for the best research paper 2020.

# PHD PORTFOLIO

Department: **Department for primary and community care**

Graduate School: **Radboud Institute for Health Sciences**

PhD period: 1-8-2018 – 13-07-2022

Promotor(s): **Prof. C.R.M.G. Fluit, Prof. J. de Graaf, Prof. N.D. Scherpbier**

Training activities	Hours
<b>Courses</b>	
• Qualitative research methods in healthcare (2017)	20.00
• Design Based Research (2017)	8.00
• Qualitative Research Methods and Analysis (2018)	84.00
• RIHS–Introduction course for PhD candidates (2018)	15.00
• Pubmed, Endnote, Searching literature for PhDs (2018)	15.00
• Profiel van een Female Topbestuurder (2018)	12.00
• Radboudumc–eBROK course (for Radboudumc researchers working with human subjects) (2019)	26.00
• Scientific Writing for PhD candidates (2019)	84.00
• Perfecting your Academic Writing Skills (2019)	42.00
• Statistiek voor promovendi met SPSS (opfriscursus) (2021)	56.00
• Deep democracy (2021)	8.00
• Radboudumc–Scientific integrity (2021)	20.00
• Vlogging and Blogging your research results (2021)	3.00
• De essentie van cultuur en gedrag (2022)	5.00
• Leiderschap programma (2022)	70.00
• RU–Analytic Storytelling (2022)	20.00
• Mediatraining bestaande uit diverse masterclasses en ronde tafel sessies (2022)	50.00
<b>Seminars</b>	
• Participating research community bijeenkomsten (2022)	60.00
<b>Conferences</b>	
• Oral presentation of preliminary results ethnographic study into intraprofessional collaboration (2018)	4.00
• Guiding a workshop about faculty development for IPE (2018)	15.00
• Guiding a workshop about intraprofessional collaboration for specialists (2018)	5.00
• Symposium: transmuraal samenwerken, muren veranderen in deuren (2018)	5.00
• Oral presentation about learning intraprofessional collaboration between residents in hospitals (2019)	4.00
• Guiding a workshop about faculty development in IPE at the European Interprofessional education network (2019)	3.00
• Guiding a workshop about IPE in medical education (2020)	4.00
• Oral presentation Chances for learning intraprofessional collaboration between residents in hospitals (2020)	5.00
• Guiding a workshop about intraprofessional education and collaboration between residents during Covid-19' (2020)	4.00
• Guiding a workshop about Interprofessional collaboration and education: how to handle culture & hierarchy (2020)	13.00
• Guiding a workshop De juiste opleiding op de juiste plek (2021)	12.00

<b>Training activities</b>	<b>Hours</b>
• Guiding a workshop for medical specialists: Hiërarchie in de interprofessionele samenwerking (2021)	5.00
• Oral presentation Understanding intraprofessional learning through the lens of power dynamics (2022)	5.00
• Oral presentation Culture change at surgery department (2022)	5.00
• Keynote presentation Powerful samenwerken (2022)	10.00
<b>Other</b>	
• Making a vlog about Chances for learning intraprofessional collaboration (2020)	6.00
• Organizing and moderating a work conference about designing intraprofessional learning among medical residents (2022)	30.00
• Developing educational materials regarding managing power dynamics in healthcare (education) (2022)	50.00
• Co-chair of the NVMO working group IPE&C (2022)	60.00
<b>Teaching activities</b>	
<b>Lecturing</b>	
• Let's hack complex health problems in an interprofessional team together with patients (for European general practitioners) (2018)	10.00
• Intraprofessional collaboration & education in elderly care (2019)	5.00
• Interprofessional collaboration & education (2019)	5.00
• Learning intraprofessional collaboration between medical residents (2019)	6.00
• Let's hack complex health problems in an intra/interprofessional team together with patients (for medical specialists) (2019)	6.00
• Intraprofessional collaboration for Pediatric trainees and General Practitioner trainees (2020)	8.00
• How to use the IPE research results for/ into your education (2020)	5.00
• In de schoenen van je transmurale collega (discipline overstijgend onderwijs) (2020)	10.00
• How to facilitate IPE as general practice teacher (2020)	7.00
• Why, What & How of InterProfessional Education (2020)	4.00
• IPE summerschool (2020)	5.00
• Learning collaboration between residents: how to benefit from hospital placements? (2020)	4.00
• Grens overstijgend leren; hoe kunnen we boundaries benutten voor interprofessioneel leren samenwerken? (2020)	8.00
• Faculty development about learning intraprofessional collaboration between primary and secondary care residents (2020)	4.00
• Teaching intraprofessional tele-consultation between General Practice & Internal medicine residents (2020)	15.00
• Interprofessioneel opleiden voor Vlaamse huisarts opleiders en medisch specialisten (2021)	4.00
• Chances for learning intraprofessional collaboration between residents in hospitals (2021)	6.00
• Webinar 'hoe interprofessioneel ben jij?' (2021)	5.00
• Online Hackathon (2021)	16.00
• The relevance of evidence-based education for primary care: interprofessionial education and entrustment/assessment (2021)	10.00
• Topclass interprofessional collaboration & education (2021)	13.00
• Lecture de juiste opleiding op de juiste plaats (2021)	5.00



<b>Training activities</b>	<b>Hours</b>
• Wetenschappelijke resultaten en design principes m.b.t. intraprofessioneel leren samenwerken tussen aios (2022)	10.00
• Hoe leren aios intraprofessioneel samenwerken? (2022)	6.00
• Webinar “hoe werkt dat, interprofessioneel samenwerken?” (2022)	5.00
• De rol van de stagebegeleider/ opleider bij interprofessioneel leren op de stagewerkplek (2022)	9.00
• Keynote presentation Juiste Opleiding op de juiste plaats in Vlaanderen (2022)	9.00
• Masterclass Teaming, Interprofessional working & Power (2022)	10.00
• Interprofessional collaboration & Network leadership (2022)	40.00
• Macht en invloed in een interprofessionele werkrelatie (2022)	5.00
• Topclass innovation in Care: Culture, Safety & Power (2022)	6.00
• Psychologische power	8.00
<b>Supervision of internships / other</b>	
• Supervising a student on research internship (2018)	28.00
• Supervising a student on research internship (2019)	28.00
• Supervising a student on research internship (2020)	28.00
<b>Total</b>	<b>1,196.00</b>

## PUBLICATIONS

### Publications in this thesis

**Looman N**, Fluit C, van Wijngaarden M, de Groot E, Dielissen P, van Asselt D, de Graaf J, Scherbier-de Haan N. Chances for learning intraprofessional collaboration between residents in hospitals. *Med Educ.* 2020;54:1109-1119. DOI 10.1111/medu.14279

**Looman N**, Scherbier-de Haan N, Fluit C. Chances for learning intraprofessional collaboration between residents in hospitals – Audio paper. Podbean, Medical education podcast from the journal Medical Education. 21 Dec. 2020 Chances for learning intraprofessional collaboration between residents in hospitals–Audio Paper with Natasja Looman (podbean.com)

**Looman N**, van Woezik T, van Asselt D, Scherbier-de Haan N, Fluit C, de Graaf J. Exploring power dynamics and their impact on intraprofessional learning. *Med Educ.* 2022; 56(4):444-555. DOI 10.1111/medu.14706

**Looman N**, de Graaf J, Thoonen B, van Asselt D, de Groot E, Kramer A, Scherbier-de Haan N, Fluit C. Designing the learning of intraprofessional collaboration among medical residents. *Med Educ.* 2022; 56(10):1017-1031. DOI 10.1111/medu.14868

### Submitted publications

**Looman N**, Fluit C, Vastenburg L, Thoonen B, Verheyen K, van der Velden J, de Graaf J, Kramer A, Scherbier N. Optimizing learning during postgraduate medical out-of specialty placements: a scoping review (*submitted*)

Bus L, van der Gulden R, Bolk M, de Graaf J, van den Hurk M, Scherbier N, Fluit C, Kuijter W, & **Looman N**. Adaptability and learning intraprofessional collaboration of residents during the COVID-19 pandemic (*submitted*)

### Other publications

**Looman N**, Bolk M, Fluit C, de Graaf. Covid-19: Les van corona: samenwerken is leuk en nuttig. We kunnen de schouder-aan-schoudermentaliteit behouden voor de vervolgopleiding. *Medisch Contact*, 27-28; 8 juli 2022; p26-28.

**Looman N**, Scheele F, Scherbier-de Haan ND. Leer transmuraal samenwerken, ook in de opleiding! *Huisarts Wet* 2020;63(7):104-5. DOI:10.1007/ s12445-020-0750-2

Van der Gulden R, Scherbier-de Haan ND, Greijn CM, **Looman N**, Tromp F, Dielissen PW. Interprofessional education and collaboration between general practitioner trainees and

practice nurses in providing chronic care; a qualitative study. *BMC Medical Education* (2020) 20:290 <https://doi.org/10.1186/s12909-020-02206-1>

Van Iersel MB, Brantjes E, de Visser E, **Looman N**, Bazelmans E, van Asselt D. Tolerance of clinical uncertainty by geriatric residents: a qualitative study. *European Geriatric Medicine* (2019) 10:517–522. <https://doi.org/10.1007/s41999-019-00199-9>

### **Education materials based on PhD research project**

Federatie Medisch Specialisten. Werkvormen Interprofessioneel opleiden in de zorg. Sept. 2022. Redactie: **Looman, N.**, van Asselt, D., Bruggink L., Dijkstra A. Te downloaden via [www.medischevervolgopleidingen.nl](http://www.medischevervolgopleidingen.nl)

**Looman N** 2022. Power Dynamics Part 1: ‘What are power dynamics’? <https://youtu.be/kVEyLRHLK2U>

**Looman N** 2022. Power Dynamics Part 2: ‘Beliefs impact power distribution’. <https://youtu.be/B87XIZWgqvA>

**Looman N** 2022. Power Dynamics Part 3: ‘Beliefs impact interaction style’. <https://youtu.be/gmn4cDfvWk0>

**Looman N** 2022. Power Dynamics Part 4: ‘Power distribution based on inequity impact subjection’. <https://youtu.be/tmG3uqG3LkM>

**Looman N** 2022. Power Dynamics Part 5: ‘Power distribution based on equity impact fearless learning’. <https://youtu.be/2q-6vrHJQ0k>

**Looman N** 2022. Power Dynamics Part 6: ‘Interaction style impact fearless learning (and working)’. <https://youtu.be/IMFt-dy1LwQ>



*“Always go with a  
good intention,  
and you’ll  
never have to be  
afraid.”*



**Fatima Noël Dariouchy**



the 1990s, the number of people in the UK who are employed in the public sector has increased from 10.5 million to 12.5 million, and the number of people in the public sector who are employed in health care has increased from 2.5 million to 3.5 million (Department of Health 2000).

There are a number of reasons for the increase in the number of people employed in the public sector. One reason is that the public sector has become a more important part of the economy. Another reason is that the public sector has become a more attractive place to work. A third reason is that the public sector has become a more important part of the welfare state.

The increase in the number of people employed in the public sector has led to a number of changes in the way that the public sector is organized. One change is that the public sector has become more decentralized. Another change is that the public sector has become more market-oriented. A third change is that the public sector has become more customer-oriented.

The changes in the way that the public sector is organized have led to a number of challenges for the public sector. One challenge is that the public sector has become more complex. Another challenge is that the public sector has become more competitive. A third challenge is that the public sector has become more demanding.

The challenges that the public sector faces are a result of the changes in the way that the public sector is organized. The public sector must be able to meet these challenges in order to continue to provide the services that it is expected to provide.

One way that the public sector can meet these challenges is by increasing the number of people employed in the public sector. This can be done by recruiting more people to the public sector. Another way that the public sector can meet these challenges is by increasing the productivity of the people who are employed in the public sector.

Increasing the productivity of the people who are employed in the public sector can be done in a number of ways. One way is by providing training and development opportunities for the people who are employed in the public sector. Another way is by providing better working conditions for the people who are employed in the public sector.

Providing better working conditions for the people who are employed in the public sector can be done in a number of ways. One way is by providing better pay and benefits for the people who are employed in the public sector. Another way is by providing better job security for the people who are employed in the public sector.

