

Postprint Version	1.0
Journal website	https://onlinelibrary.wiley.com/doi/abs/10.1111/jep.12939
Pubmed link	https://www.ncbi.nlm.nih.gov/pubmed/29878610
DOI	10.1111/jep.12939

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Quality improvement opportunities for handover practices in birth centres: A case study from a process perspective

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ABSTRACT

Rationale, aims and objectives: Handovers within and between health care settings are known to affect quality of care. Health care organizations, struggle how to guarantee best care during handovers. The aim of this paper is to evaluate handover practices in Dutch birth centres from a process perspective, to identify obstacles and opportunities for quality improvements.

Methods: This case study in 7 Dutch birth centres was undertaken from a process perspective by conducting observations and using process mapping. This study is part of the Dutch Birth Centre Study.

Results: Solutions to obstacles during handovers from a birth centre to a hospital were identified in at least 1 of the 7 birth centres. Four of the centres had agreements with a hospital for client support when a caregiver in a birth centre was absent. Face-to-face communication during handover was observed in 6 of the 7 centres. An electronic health record was noted in 1 centre; joint training of acute situations was available in 2 centres with 3 centres indicating that this was not compulsory. Continuity of caregiver was present in 4 birth centres with postpartum care available in 3 centres.

Conclusions: Ensuring quality during handovers requires a case-specific process approach. This study reveals distinctive aspects during handovers, concrete obstacles, and potential solutions for quality improvements in inter-organizational networks, transferrable to birth centres in other countries as well.

1 INTRODUCTION

Handovers are a serious issue in health care as they are known to affect quality of care.¹⁻³ Often, the organization of health care services requires the client to move between services, such as from primary care to secondary care, across team shifts, and disciplines. These handovers serve as the basis for transferring *responsibility* (being in charge) and *accountability* (liability) for the care of clients.⁴

One area of health care where there has long been a debate on the effectiveness and the safety of the operational set-up of the care processes is the maternity care system. The debate around the Dutch system increased after the results became known from the 2008 edition of the EURO-PERISTAT study, which put the Netherlands in perinatal health outcomes close to the bottom of a ranked list of European countries.⁵ The historical organization of the Dutch maternity system has a clear segmentation in primary care (community midwife-led) and secondary care (obstetrician-led).

In the Netherlands, pregnant women with an uncomplicated pregnancy can choose where they would like the birth to take place: at home, in a hospital, or in a birth centre. The number of birth centres in the Netherlands has increased rapidly over the last 15 years. Many birth centres have been established in other countries as well, including the United States, the United Kingdom, Australia, and Sweden.⁶⁻⁹ Birth centres are midwifery-managed locations that offer care during labour and birth to women with uncomplicated pregnancies. They have a homelike environment and provide facilities to support physiological birth. Community midwives take primary professional responsibility for care, assisted by maternity care assistants.¹⁰

Most Dutch community midwives work in group practices in the community. They are autonomous in their decisions during birth care. When a complication occurs or medical assistance for pharmacological pain relief is requested, the woman will be referred to a secondary care obstetric hospital unit. Depending on the reason for referral, either the obstetrician or the paediatrician takes over responsibility of care from the community midwife. Reasons for referral are defined in the List of Obstetric Indications, which is a multidisciplinary guideline.¹¹ Birth centres are often located close to the obstetric care unit of a hospital but can be freestanding from a hospital as well.^{10, 12}

The clear segmentation in primary and secondary care requires the pregnant women to move often from 1 type of service to another. During the birth process, health care is essential to guarantee the health and life of the mother and her baby. Transfers during labour or birth can undermine this, because time is a factor that directly affects maternal and child health.¹³⁻¹⁵ In the Netherlands, research has shown that a total of 70.1% of nulliparous women (women who have not given birth before) who wanted to give birth in a birth centre were referred to the hospital during or after childbirth. A total of 31.8% of multiparous women (women who have given birth before) who wanted to give birth in a birth centre were referred to the hospital during or after childbirth. These were mostly non-urgent referrals including pain relief.¹⁶ Inappropriate risk assessment, regional variations in process and outcome aspects, and poor communication between community midwives and obstetricians are often topic of discussion on handover processes in and outside the Netherlands.¹⁷⁻²¹ Standards or best practices for handovers in (Dutch) birth centres are not available. The aim of this paper is to evaluate handover practices in Dutch birth centres from a

process perspective, to identify obstacles and opportunities for evidence based quality improvements.

2 METHODS

2.1 Design

Case study research has been applied since it allows answering questions regarding the “how,” “what,” and “why” aspects with a full understanding of the nature and complexity of the phenomenon.²²⁻²⁵ Case study research is particularly appropriate for early, exploratory investigations,²³ like this study is.

This multiple case study was undertaken from a process perspective by conducting observations and using process mapping with a Business Process Model and Notation (BPMN) approach. BPMN illustrates the workflow (interrelated work activities and resources) in organizations readily understandable by all stakeholders. The whole work process crosses several functions or other organization entities, which is illustrated on the map.²⁶ The handover practices were evaluated in 7 Dutch birth centres, and possible obstacles and opportunities for quality improvements were identified.

This study is part of the Dutch Birth Centre Study.²⁷ The national project evaluates the effect of Dutch birth centre care on aspects such as effectiveness, cost-effectiveness, and experiences. To better understand the whole phenomenon “birth centres,” we did not look only into health outcomes, client experiences, and costs but also into the processes that lead to and, thereby, influence these outcomes.

2.2 Sample

After an initial first exploratory round of visits to 15 birth centres in the Netherlands, 7 birth centres were selected with the aim to achieve a maximum variation, see Table 1. The main criteria for case selection included variation in geographical location, spread in operational period, and variation in type of birth centre based on location with respect to the obstetric unit. Three types of birth centres can be distinguished: (1) freestanding birth centres, (2) birth centres alongside the obstetric unit, and (3) birth centres on-site the obstetric unit.¹⁰

[TABLE 1]

2.3 Data collection

The data collection is based on a triangulation of different types of data: comprehensive field notes of direct observations of the professional staff working in the 7 birth centres, informal conversations with them, and studying of documents, including policy documents and agreements. These documents were obtained from the managers of the birth centres. Furthermore, a researcher (M. H.) measured twice the distance (in time) between the birth centre and the nearest hospital obstetric care unit by enacting a transfer and an average time has been calculated. The researcher (M. H.) made field notes of the observations of the daily operations and informal conversations in the birth centres. To focus on the observations, sensitizing concepts are used.²⁸

To direct the study, these sensitizing concepts are discussed and specified during the data collection period by the researchers (M. H. and H.A.A.). Equally spread over the 7 birth centres, the observations took in total around 1000 hours (based on

saturation), during day, night, weekdays, and weekend, spread over 1 year (April 2013 to April 2014). A high number of observation hours were needed to account for periods of low activity in the birth centre.

2.4 Ethical considerations

Oral informed consent was obtained from the management team and clients of the birth centres. The design and planning of the study were presented to the Medical Ethics Committee of the University Medical Centre Utrecht. They confirmed that an official ethical approval of this study is not required.²⁹

2.5 Data analysis

Analysis started as soon as the first data were collected and continued with each additional observation. Atlas software was used for data management of the observations, informal conversations, and (policy) documents and analysis. The first step in the analysis was coding the transcripts of the observations and informal conversations. Codes that relate closely to the text fragments (eg presence of caregivers, transport, continuity of care, and information exchange) were used. After a while, 2 researchers (M. H. and H. A. A.) discussed them. The coded transcripts were then analysed to identify returning topics of which handover practices is one. In a common meeting the observed handover processes were discussed with employees of each birth centre (including community midwives, maternity care assistants, obstetricians, and managers; on average 5 caregivers per birth centre). The result of the meeting was a sketched process map. This sketched process map supported the employees by identifying possible obstacles and opportunities for quality improvement. All their comments were documented in notes and analysed. After the meeting, a Business Process Management tool (BPMN 2.0 Signavio) was used by the researcher to map the current processes. This was a common understanding of the process capturing the physical journey, the flows of information, and responsibilities.

Analysing from a process perspective acknowledges the importance of the context to an understanding of why interventions and strategies work, how, and under which circumstances.³⁰ Two of the researchers (M. H. and H.A.A.) compared the 7 maps and identified the differences in obstacles and opportunities. As a member check to validate the qualitatively generated data, the process maps were given back to the managers of the birth centres. All the managers confirmed that the interpretation of the processes was accurate.

3 RESULTS

3.1 Handover practices

We observed that there were distinctive aspects about the handover practices in every birth centre. As an example of the process mapping, Figure 1 provides an overview of the observed care processes in 1 birth centre (D), including the handovers, from the start of labour to postpartum care at home.

[FIGURE 1]

The figure consists of 3 lanes that represent the organization parts: the upper lane is the client's home, the middle lane represents the birth centre, and the lower lane is the hospital. The process starts upper left at the client's home.

Different kinds of caregivers are involved during the handovers from a birth centre to a hospital. In the birth centre, the *maternity care assistant/birth assistant* assists the community midwife during childbirth and works under the supervision of the community midwife.³¹ The independently operating *community midwife* is responsible and assists women with uncomplicated pregnancies during childbirth and the postpartum period in a birth centre. If complications occur or medical assistance for pharmacologic pain relief is requested, she refers them to an obstetrician or paediatrician.³¹ Pharmacologic pain relief is given by an *anaesthetist*. Not all midwives in the Netherlands are independent practitioners; some are employed in the hospital setting. These *clinical midwives* function semi-autonomously within the hospital setting under the responsibility of and together with obstetricians.³² The *obstetrician* accompanies childbirths that require more complex and specialized care, and the tasks of the *paediatrician* include caring for premature babies, babies with a low birthweight, or signs of infection. In the event the care takes place in the hospital, an obstetric *nurse* of the obstetric unit assists the clinical midwife or obstetrician during childbirth.

Distinctive aspects are summarized in Table 2 for all 7 birth centres. In a few birth centres, no matter if clients are present or not, the caregivers are standard present in the birth centre. In other birth centres they are not, the caregivers arrive in the birth centre when a woman in labour calls. If the client is already in the birth centre and professional help is needed while the community midwife and/or maternity care assistants is/are not there yet, the clinical midwife and/or nurse, working in the hospital, temporarily take(s) over the responsibility of care. This is not the case in all birth centres; in 1 birth centre, there is no caregiver working in the hospital to momentarily take over the responsibility of care in the birth centre and the client who is in labour has to wait in the corridor without professional help.

In case of referral from the birth centre to the hospital, the caregivers of the hospital are informed through face-to-face or telephone communication. The medical history is transferred on paper or digitally. The transfer of the client from a birth centre to hospital is done in 1 birth centre by ambulance/car, in some birth centres, by wheelchair or bed. In some birth centres, no transport is needed; the caregivers change room. Exceptions for transfer are locally described and included situations as shoulder dystocia, resuscitation of the neonate, and postpartum haemorrhage. In those situations, the protocol is that the secondary caregiver (clinical nurse/obstetrician or paediatrician) is called and has to come from the hospital to the birth centre for referral. Average transfer times between the birth centres and the hospitals vary between less than 1 minute and 20 minutes.

In some birth centres, when all birthing rooms at the hospital are occupied during a referral, the birth takes place in the birth centre. The woman does not get transferred, and the obstetrician comes to the birth centre to take over the responsibility of care during birth. In other birth centres, the client and community midwife have to go by

car/ambulance to another hospital. The continuity of care postpartum differs across the 7 birth centres. In some birth centres, the client goes home (with her medical record on paper) a few hours after birth. The maternity care assistant who will provide care at home gets informed by phone or fax. In 1 birth centre, the same maternity care assistants as those during birth join the client at home. In a few birth centres, it is possible to stay in that birth centre a few days after birth.

[TABLE 2]

3.2 Quality obstacles

Seven quality obstacles (caregiver absence on arrival, no direct contact during handover, use of multiple electronic health records, inadequate caregiver's knowledge on procedures, unfamiliarity with team members, no continuity of caregiver, and no continuity of care for client) were identified and are summarized in Table 3 for all 7 birth centres. The 7 obstacles can interrupt the continuity of intra-partum and postpartum care (in acute situations), lead to missing information during key moments and influence the collaboration.

[TABLE 3]

3.3 QUALITY IMPROVEMENTS

Potential solutions to the aforementioned quality obstacles were identified. All these solutions were observed in at least 1 of the 7 settings studied. In summary, 4 of the 7 birth centres had agreements with the hospital for client support when a caregiver was absent. Face to face communication during handover was observed in 6 of the 7 birth centres. An electronic health record was noted in 1 birth centre; joint training of acute situations with maternity care assistants, (community) midwives, nurses, obstetricians, and paediatricians was available in 2 birth centres (compulsory) with 3 centres indicating that this was not compulsory. Continuity of caregiver was present in 4 birth centres with postpartum care available in 3 centres.

4 DISCUSSION

In this study, our aims were (1) to evaluate handover practices in birth centres from a process perspective, (2) to identify possible obstacles, and (3) opportunities for quality improvements in the practice of handovers in birth centres.

4.1 Strengths and limitations

To our knowledge, this is the first study that is undertaken from a process perspective to identify obstacles and facilitators of handover practices in inter-organizational networks by using observations and process mapping. Process mapping can be effective in evaluating whether or not improvements to the current operational process, including handovers, are possible and desirable.¹

We used a BPMN approach to map to processes. BPMN is designed for different kinds of users, which makes it suitable for maternity care process modelling. With this approach, it is possible to model different events and exceptions for routing a process. This matches with the health care processes and more specific the maternity care processes, which tend to have many exceptions.³³ Until now application of process mapping in maternity care is somewhat limited.³⁴ This perspective allowed

us to explicitly analyse relationships and interactions between caregivers that are involved in the care process³⁰ and should therefore be used more often in health care.

Although the validity of the data was increased by our observations of the care process in the natural setting,³⁵ all these observations were assessed by a single researcher. As a member check to validate the qualitatively generated data, the process maps were given back to the managers of the birth centres. All the managers confirmed that the interpretation of the processes was accurate.

Birth centres have internationally been studied from the point of various domains, all focussing on *structure and performance outcomes* instead of the process.³⁶⁻³⁹ Beside this, the studies are mainly based on *quantitative* data. These studies ignore the “black box” of how processes link structure to outcome. This article contributes to a broad evaluation of birth centre care.²⁷ It is 1 of the sub-studies based on data from the Dutch Birth Centre Study. The aim of this national study was to provide evidence-based recommendations for birth centre care in the Netherlands. To make these recommendations, all sub-studies (most of them focussing on performance outcomes) of the Dutch Birth Centre Study must be considered. These recommendations are (partly) transferable to birth centres in other countries, including the United States, the United Kingdom, Australia, and Sweden.

5 DISCUSSION

This study can be used to increase awareness on handover processes in birth centres in and outside the Netherlands. It demonstrated differences in handover processes between birth centres. Every (unnecessary) process interrupts the process of physiologic childbirth.⁴⁰ Evaluation and adjustment of these processes can lead to more optimal outcomes. Awareness of differences between birth centres can be the first step to change practice.

Solutions to obstacles during handovers from a birth centre to a hospital were identified in at least 1 of the 7 birth centres. Four of the centres had agreements with a hospital for client support when a caregiver in a birth centre was absent. These agreements ensure that there will always be someone to take care of the client when she arrives in the birth centre. In a freestanding birth centre, which is separated from a hospital with obstetric services, the community midwife should make sure she arrives together with the client.

Face-to-face communication during handover was observed in 6 of the 7 centres. An electronic health record was noted in only one of the 7 birth centres. The other 6 birth centres use a paper hand-held record for sharing information. The use of an electronic health record has demonstrated significant improvements to the collection of best practice variables in a maternity care setting.⁴¹ Additionally, the data in an electronic health record were more available to relevant caregivers and more easily retrieved than from a paper hand-held record. The aforementioned aspects improve efficiency and reduce errors.

Joint training of acute situations was available in 2 centres with 3 centres indicating that this was not compulsory. In some situations, critical communication must occur, often at potentially highly stressful times. To prevent (communication) errors, it is important to focus the training on the team as a whole. Obstetrics is a field in which several professionals have to work together under extreme time pressure.^{42, 43} During the training, the caregivers (obstetricians and paediatricians) who come only

to the birth centre in acute situations will become more familiar with the birth centre setting and their colleagues.

Continuity of caregiver was present in 4 birth centres with postpartum care available in 3 centres. (Un)Familiarity of the woman with the caregiver is an aspect that can largely explain the differences in client experiences between transferred and non-transferred women.^{44, 45} These experiences are an important indicator of the quality of health care. In the Netherlands, pregnant women are often familiar with their community midwife. In case of referral to secondary care, a pregnant woman meets new caregivers with whom she is not familiar. Because of the segmentation of primary and secondary care, it is difficult to guarantee a familiar caregiver. One possible solution would be a community midwife, who continues accompanying the woman.

Above suggested solutions are all based on the results of this multiple case study. The other sub-studies of the Dutch Birth Centre Study give solutions according to handover obstacles as well. One of the sub-studies has shown a high number of referrals for women who planned birth in a birth centre.¹⁶ Referrals have a direct effect on the outcomes, as referral often leads to the start of cascade of interventions. Need for pain relief is one of the most important reasons for referral. After the data collection of the Dutch Birth Centre Study, nitrous oxide was introduced in birth centres to be used as an alternative analgesia for use during labour. This introduction may result in a lower number of referrals to a hospital. Another sub-study of the Dutch Birth Centre Study showed that a referral to the hospital had a negative effect on the experiences of women, while the physical transfer from the birth centre to the obstetric unit was not experienced as a problem.³⁶ Above findings make clear that to make recommendations to improve birth centre care in and outside the Netherlands, all sub-studies of the Dutch Birth Centre Study must be considered.

6 CONCLUSIONS

Ensuring quality during handovers requires a case-specific process approach to understand and improve care. Through analysis from a process perspective, this study reveals distinctive aspects during handovers, identifies 7 concrete obstacles and 6 potential solutions, which might be transferrable to birth centres outside the Netherlands.

7 IMPLICATIONS

In the last decades, many birth centres have been established in different countries. Birth centres are settings that uphold the maternity care system in which (community) midwives take responsibility for births of women with low risk of complications, in a non-clinical setting. This functional set-up often requires the client to move from one type of service to another. These handovers increase the opportunity for errors and have a negative effect on client experiences. They cannot always be prevented and must, therefore, be organized as optimal as possible. This study provides potential solutions for that.

Acknowledgements

This work was supported by the Netherlands Organization for Health Research and Development (ZonMw) (grant no. 209020012). This funding source had no role in

the design of the study, execution, analyses, interpretation of the data, or decision to submit results.

Conflicts of interest

The authors declare no conflict of interest.

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TABLES

Table 1. Characteristics of the cases

Birth centre	initiators	Reason of establishment	Since	type of region	Location of birth centre	Number of births in 2013
A	Insurance company	Distance to a hospital for emergency care during home birth is otherwise too long	2009	Small city in a rural area (1300 inhabitants per km ²)	Freestanding	113
B	Ten community midwifery practices	The higher demand for hospital births led to capacity shortfall of the obstetric care unit.	2007	Large city (4888 inhabitants per km ²)	Alongside	1090
C	Community midwives	Maintenance and strengthening maternity care to support the physiological birth.	2012	Small city (1183 inhabitants per km ²)	Alongside	235
D	Community midwives, obstetricians, organization of maternity care, insurance company, board of the hospital and the municipality	The higher demand for hospital births led to capacity shortfall of the obstetric care unit.	2009	Large city (2960 inhabitants per km ²)	Alongside	734
E	Community midwives	The higher demand for hospital births led to capacity shortfall of the obstetric care unit.	2004	Large city (3481 inhabitants per km ²)	On-site	888
F	Maternity care professionals from different backgrounds	Intensive collaboration to enhance quality in maternity care	2011	Medium-size city (1794 inhabitants per km ²)	On-site	402
G	Board of the hospital, community midwives and obstetricians	Strengthening obstetric and midwifery care	2013	Medium-size city (2037 inhabitants per km ²)	On-site	264 (since May)

Table 2. Results of the 7 birth centres on handover practices from a process perspective

Birth centre	Progress of birth	Standard presence of caregivers in birth centre	Transfer from birth centre to the hospital	Transmission of information during referral	Possibility to stay postpartum in birth centre
A	Checked during home-visit	No	By ambulance or car	On paper, community midwife consults caregivers by phone	No, the client goes home, if possible with the same maternity care assistant
B	Checked during home-visit or in the birth centre	No Hospital support available	By wheelchair or bed and exceptions for transfer are locally described	On paper, community midwife consults caregivers by phone	No and no maternity care assistance at night at home
C	Checked during home-visit	No	By wheelchair or bed and exceptions for transfer are locally described	On paper, community midwife consults caregivers by phone	No and no maternity care assistance at night
D	Checked during home-visit or in the birth centre	Yes Hospital support available	By wheelchair or bed and exceptions for transfer are locally described	On paper, community midwife consults caregivers by phone	Yes
E	Checked in the birth centre, possible to be send back home	Yes Hospital support available	No transport needed, caregivers change room	Digitally transferred, community midwife has face-to-face contact with caregivers	Yes
F	Checked during home-visit	No Hospital support available	No transport needed, caregivers change room	Medical history on paper, community midwife has face-to-face contact with caregivers	Yes
G	Checked during home-visit	No Hospital support available	No transport needed, caregivers change room	Medical history on paper, community midwife has face-to-face contact with caregivers	No and no maternity care assistance at night at home

Table 3. Results of the 7 birth centres on quality obstacles from a process perspective

Birth centre	Caregiver presence on arrival	Contact during handover	Use of electronic health records	Caregivers knowledge on procedures	Familiarity with team members	Continuity of familiar caregiver	Continuity of care for client
A	Not present	Not direct	Multiple	Adequate	Yes	No	Yes
B	Not present	Direct	Multiple	Adequate	No	Yes	No
C	Not present	Direct	Multiple	Inadequate	No	Yes	No
D	Present	Direct	Multiple	Adequate	Yes	Yes	Yes
E	Present	Direct	Single	Adequate	No	Yes	Yes
F	Not present	Direct	Multiple	Inadequate	No	No	Yes
G	Not present	Direct	Multiple	Adequate	No	No	No