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Interaction and Mutuality in Physical Therapy for Preterm Infants and Their Parents

A qualitative study with observations and interviews

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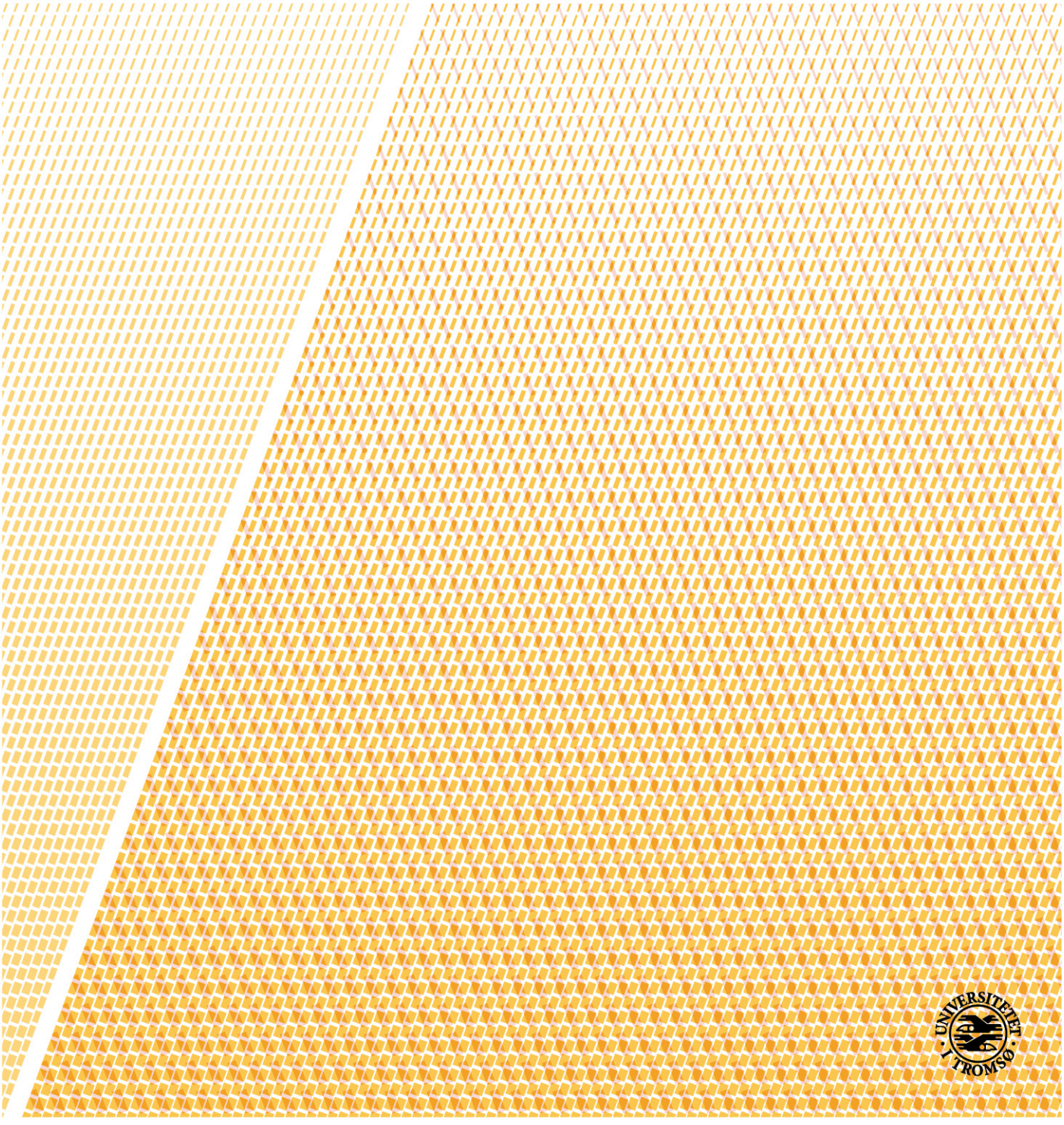

Acknowledgements

Once a clinician, always a clinician. This has been my perception of myself ever since I finished my bachelor degree in 2001. When I started my master degree in 2007, it was because I wanted to develop practical skills that I could use in my everyday work as a pediatric physical therapist. However, given the opportunity, I accepted a PhD candidate position at UiT The Arctic University of Norway in 2011. Somewhat concerned about taking this step away from the clinic, I was excited to learn more and reassured by the fact that clinical practice would be my field of investigation. Today, I am excited that I grasped this opportunity and stepped into the academic sphere. Also, I am excited to say that through the work in this project I believe that I have developed both my academic skills and my skills as a clinician. I have had the opportunity to develop my knowledge and views regarding clinical practice, learned to reflect on the theoretical underpinnings and conduct of current clinical practice, and identify needs of improvements and progress for the pediatric physical therapy profession.

Thank you, UiT The Arctic University of Norway, for giving me the opportunity to do this, right here in my home town with family and friends around me. I also extend my great gratitude to The Norwegian Fund for Post-graduate Training in Physiotherapy for providing funding for the project, and to my supervisor Gunn Kristin Øberg for making it all happen by investing time and effort into project planning, funding applications and in encouraging me to apply for the position.

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Abstract

Preventing, detecting and treating motor impairments are at the core of pediatric physical therapy. In recent decades, this profession has moved away from a hierarchical, instructive service model and toward a collaborative, family-centered care approach. While the principles of family-centered care are described in the literature, less in known about its content and conduct in clinical practice. Therefore, it is necessary to gain more knowledge about how physical therapists (PTs) can fulfill their roles in delivering knowledge-based, family-centered services.

Infants who are born preterm are at risk of neurodevelopmental impairments, which commonly include motor problems. In Norway, PTs in the municipalities play a key role in the delivery of family-centered services to preterm infants and their parents. In addition to monitoring and treating infant motor impairments, PTs are expected to educate parents and help them to cope with and adapt to life with a preterm infant. In this work, motor learning activities can be a valuable tool. Infants' explorative, sensory-motor play is a driving force during development that PTs can use to promote the preterm infant's motor development and support the parent-child relationship.

In physical therapy, the emergence of the family-centered care paradigm has been paralleled by an increase in skepticism toward more traditional physical therapy treatment approaches. Specifically, disagreement exists regarding which is more appropriate: hands-on or hands-off approaches. However, this controversy might be counterproductive. In the search for new and improved treatment approaches we need more knowledge about benefits and potential improvements across the range of available approaches.

In this doctoral project, we investigated municipality physical therapy services for preterm infants and their parents during the first year post-hospital discharge. Based on the view that infants' motor, social and cognitive skills co-develop via interactions with people and surroundings and that this development connects with the parent-child relationship, we aimed to identify elements that are essential to PTs' promotion of infants' motor development and enablement of parents as caregivers for their child. The overall research question was:

> What are the interactional keys to success in PTs' family-centered work with preterm infants and their parents?

To investigate this, we turned to enactive theory and its integration of insights from dynamic system theory, neuroscience and phenomenology of the body. From the enactive view, our human way of making sense is deeply embedded in our interactions with both other individuals and the world. This means that interactions shape us and are shaped by us, and we develop our cognition and understanding of the world through our embodied actions in it. We connected these insights with neuroscientific theories regarding motor development and learning, the consequences of brain lesions on these processes for the preterm infant, and the implications of these insights for pediatric physical therapy practice. Based on these theories, explorative sensory-motor play is a source of motivation and the basis for the infant's attention, learning and development. By engaging in interactive play, infants discover and explore their abilities to move and to engage with objects and people. When we relate these insights to the enactive perspective, we can shed new light to the magnitude of embodiment, interaction and successful achievements during these play and learning processes.

This was a qualitative study that included seven triads of infant-parent(s)-PT participants who each received three researcher visits when the infant was approximately 3, 6 and 12 months old. Data were collected from December 2012 to November 2014. A total of 20 visits were completed (one third visit was missing). At each visit, the researcher video recorded physical therapy sessions and individual interviews with PTs and parents. The data analysis adhered to the systematic text condensation approach described by Malterud, and Nvivo 10 was used as the sorting tool.

Paper I built on findings from the interviews with parents and demonstrated how the parents perceived that physical therapy contributed to their new role and coping abilities as caregivers for their preterm child. In paper II, our interpretation of the observations of therapy sessions lead to the establishment of the new concept *enactive therapeutic sensory-motor play*, which describes how the PTs were able to merge their targeted therapeutic actions with the infant's play initiatives and engagement. Paper III drew on the interviews with the PTs together with observations from therapy sessions, as we investigated how the PTs' embodied-enactive clinical reasoning emerged and developed in collaboration with the infant and parent(s). Taken together, the included papers describe different aspects of how physical therapy can be an arena of learning for both the preterm infants and their parents. These learning processes are interactive and interdependent. When parents learn how to support their infant in everyday life, the infant will acquire more opportunities for the playful learning of motor skills. Conversely, as the infant's performance in sensory-motor play activities is facilitated and improved in cooperation with the PT, the parents learn about their infant's interactional, sensory-motor capabilities and development. Turning to the PTs, their ability to connect with the infant and parent(s) in these interactional learning processes extends their therapeutic repertoire and enables their tailoring of intervention to the individual needs of the infant and parent(s).

In the discussion, the findings from the three papers are further explored in terms of identifying interactional keys to success. The preterm infant's learning relies on the PT providing novel, motivating motor experiences and appropriate support, which facilitate the successful achievement of the infant's activity goals. Both PTs and parents are important facilitators of the preterm infant's motor achievements, and need to work together to support and engage the preterm infant's playful motor learning. Hands-on techniques can support the preterm infant's self-initiated exploration and the selection and refinement of movement strategies. Thus, PTs and parents should engage in a mutual exploration of where, when and how to use their hands to improve the infant's motor performance and engagement in play activities. The PT's welcoming of the parents' interactional knowledge about the infant enhances mutuality and collaboration during these processes. However, it is difficult to facilitate all of these processes at the same time. Therapeutic encounters include a multitude of interactional constellations in which the infant, parent(s) and PT can all be active participants. Nevertheless, they might all occasionally need to play the role of a third-party outsider in the interaction. A skillful PT has learned to attend to these dynamics and allows for fluency and mutuality in their interactions with the infant and parent(s), as they all cooperate and co-create meaning in the learning of new, interactive, playful movement possibilities and skills.

This investigation of the interactional aspects of pediatric physical therapy and our connection to enactive views of development and learning supports advancements and concurs with a petition requesting more inclusive theoretical approaches in physical therapy. We have extended the current understanding of and contributed to the debate regarding preterm infants' learning and development in addition to the principles of family-centered care and clinical reasoning in physical therapy. Future

research should support the further development of the concept of enactive therapeutic sensory-motor play and should include investigations of the use of toys and technology. Furthermore, the extent and adequateness of parent involvement and education as a component of family-centered care in physical therapy needs to be further explored. Finally, how PTs learn professional and interactional skills and how these skills influence their role as and confidence to become positive contributors to children and parents are topics that should be further investigated.

List of papers

Paper I: Håkstad, R. B., Obstfelder, A., & Øberg, G. K. (2015). Parents' Perceptions of Primary Health Care Physiotherapy With Preterm Infants: Normalization, Clarity, and Trust. Qualitative Health Research, 26(10), 1341-1350. doi: 10.1177/1049732315608137

Paper II: Håkstad, R. B., Obstfelder, A., & Øberg, G. K. (2017). Let’s play! An observational study of primary care physical therapy with preterm infants aged 3–14 months. Infant Behavior and Development, 46, 115-123. doi: http://dx.doi.org/10.1016/j.infbeh.2017.01.001

Paper III: A Qualitative Study of Clinical Reasoning in Physiotherapy with Preterm Infants and Their Parents: Action and Interaction (in review).

Abbreviations and definitions

CP	Cerebral Palsy
CR	Clinical Reasoning
FCC	Family-centered care
GA	Gestational age
Infant	0-2 years old
LBW	• Low birth weight: 1501-2500 g. • Very low birth weight = VLBW: 1001-1500 g • Extremely low birth weight = ELBW: ≤ 1000 g
NGST	Neuronal group selection theory
NICU	Neonatal Intensive Care Unit
NOPPI	Norwegian Physiotherapy Study in Preterm Infants
Preterm infant	Infants born at < 37 week GA. Subgroups: • Moderate to late preterm = 32-<37 weeks GA • Very preterm = 28-<32 weeks GA • Extremely preterm = <28 weeks GA
PT	Physical therapist
RCT	Randomized controlled trial

1 Introduction

1.1 Background

On average, one out of every ten infants in the world is born preterm (Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007). In Norway, the frequency of preterm births is reported to be slightly lower, at approximately one out of 15 births (Markestad & Halvorsen, 2007). Children have a higher risk of developing motor, cognitive and social impairments when they are born preterm than when they are born at term (Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007; Sansavini et al., 2014). Motor development impairments have been reported at frequencies ranging from 17 to 48% (Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007), and they can persist and become worse with time (Sansavini et al., 2014).

The promotion of motor learning and the treatment of motor impairments is at the core of pediatric physical therapy. Thus, physical therapists (PTs) contribute to preventing, detecting and treating motor impairments in preterm infants (Markestad & Halvorsen, 2007). In Norway, municipality PTs deliver services and play a key role in family-centered care (FCC) for preterm infants and their parents (Markestad & Halvorsen, 2007). The practice of FCC has emerged in recent decades (Campbell, Palisano, & Orlin, 2012; S. King, Teplicky, King, & Rosenbaum, 2004) and is now considered a key principle of pediatric physical therapy treatment (Campbell et al., 2012; S. King et al., 2004; Markestad & Halvorsen, 2007). FCC is based on a mutual, overall goal of improving developmental outcomes for the child, and health care providers are encouraged to act respectful and supportive and to facilitate a partnership with the family (S. King et al., 2004). This requires that PTs collaborate with parents to accommodate their goals and priorities and to provide education and emotional support as part of their services (Dirks & Hadders-Algra, 2011; Jansen, Ketelaar, & Vermeer, 2003; Levitt, 2010). Furthermore, FCC encompasses individualized therapeutic measures through which the PT works to promote the parent-child relationship and to involve the parents in the therapy without overwhelming them with knowledge and tasks (Dirks, Blauw-Hospers, Hulshof, & Hadders-Algra, 2011; Levitt, 2010; Scales, McEwen, & Murray, 2007).

While the principles of FCC are well-described in the literature, little is known about how municipality PTs perform these measures in clinical practice. With the recent implementation of the Norwegian Coordination Reform, PTs in the municipalities are faced with new challenges. Patients are transferred earlier from hospitals, and the governmental demand for well-integrated, high-quality healthcare services is rising in the municipalities (Helse og Omsorgsdepartementet, 2009). Moreover, because the parents of preterm infants are at risk of being overwhelmed by information during hospitalization (Dusing, Murray, & Stern, 2008), information and educational measures should continue to be provided after hospital discharge. However, a national guideline raises concern regarding municipality PTs' lack of knowledge about preterm infants, and it has been argued that this could lead to poor service delivery and insecurities in both the PT and parents (Markestad & Halvorsen, 2007). Thus, we need to know more about the content and conduct of physical therapy practices in the municipalities and how PTs can fulfill their role in delivering knowledge-based, family-centered services for preterm infants and their parents.

1.2 The preterm infant

Infants born at <37 week gestational age (GA) are defined as preterm and are further categorized as extremely preterm (<28 weeks GA), very preterm (28-<32 weeks GA) and moderate to late preterm (32-<37 weeks GA) infants. A preterm birth puts an infant at risk of neurodevelopmental impairments across the motor, cognitive, behavioral and social domains. These impairments can range from more subtle learning and behavioral problems, attention deficits and developmental coordination disorders to more profound impairments, including mental retardation, visual and hearing impairments, and different severities of cerebral palsy (CP) (Allen, 2008; Anderson, 2014; Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007; Johnson, 2007).

As advancements have emerged in medical and intensive care, preterm infants have become more likely to survive. However, this increase in the survival of ever younger and smaller infants has its consequences. For example, an increase in the risk of neurodevelopmental impairments has been associated with low birth weight (LBW), low GA, low Apgar scores and the severity of medical conditions (Allen, 2008; Ambalavanan et al., 2012; Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007; Moore, Lemyre, Barrowman, & Daboval, 2013; Spittle, Orton, Anderson, Boyd, & Doyle, 2012). While there appears to be an overall declining risk of severe impairments in preterm infants (Fawke, 2007), the statistics regarding extremely LBW children indicate that approximately 5-15% of them will have CP and an additional 35-45% of them will have other impairments that often persist into adolescence and adulthood (Allen, 2008; Burnett et al., 2015; Fawke, 2007; Marlow, Hennessy, Bracewell, Wolke, & Group, 2007; Spittle et al., 2012). Recently, there has also been an increased awareness about the high incidence of impairments among so-called “low risk” (i.e., moderate and late preterm) infants (Adams-Chapman, 2006; Arpino et al., 2010; Boyle & Boyle, 2013), and strong indications suggest that we must reconsider the risk of neurodevelopmental impairments in this group (Arpino et al., 2010). In fact, even the group of latest preterm infants (GA 34-36 weeks) has been shown to demonstrate persistent delays across developmental domains, with cognitive impairments being most predominant (Tripathi & Dusing, 2015).

When it comes to motor impairments, studies indicate that preterm infants have delayed adaptive postural control development (Dusing, Thacker, & Galloway, 2016) and struggle with the modulation and fine-tuning of movements (Fallang, 2004; Fallang, Saugstad, & Hadders-Algra, 2003; Hadders-Algra, Brogren, Katz-Salamon, & Forssberg, 1999; van der Fits, Flikweert, Stremmelaar, Martijn, & Hadders-Algra, 1999). They tend to display fewer postural adjustments, less variability and more co-contractions, resulting in the maintenance of control in a more fixed position (de Groot, 2000; Dusing et al., 2016; Fallang & Hadders-Algra, 2005; Samsom & de Groot, 2001). These deficits in the learning and development of postural control appear to be closely related to other motor development problems (Samsom & de Groot, 2001; van Haastert, de Vries, Helders, & Jongmans, 2006) such as motor delays, asymmetries and reduced quality in reaching, sitting, four-point kneeling, crawling and walking activities (Bucher, Killer, Ochsner, Vaihinger, & Fauchère, 2002; Bylund et al., 1998; de Groot, Hopkins, & Touwen, 1997; Fallang, 2004; Gorga, Stern, Ross, & Nagler, 1988; Pin, Eldridge, & Galea, 2010). Nevertheless, it is important to keep in mind that preterm infants are a heterogeneous group, and their motor developmental outcomes vary accordingly. On the positive side, some preterm infants actually present with better general motor and behavioral development during the first year than are observed in full-term infants (Fallang, 2004; Fallang, Saugstad, Grogaard, & Hadders-Algra,

2003). Thus, in healthy preterm infants, early extra-uterine experiences might serve to advance development.

1.3 The parent-child relationship

Having a preterm child can be a stressful event for parents (Schappin, Wijnroks, Uniken Venema, & Jongmans, 2013). The infant's medical needs during hospitalization can make it difficult for the parents to bond with the child (Aagaard & Hall, 2008). In addition, the preterm infant's interactional challenges are apparent from the beginning. During early infancy, preterm infants tend to be more irritable and to have less attentional capacity and decreased responsiveness and activity levels than term infants (Forcada-Guex, Pierrehumbert, Borghini, Moessinger, & Muller-Nix, 2006; Korja, Lehtonen, & Latva, 2012; Treyvaud, 2013; Wolf et al., 2002). Thus, caring for a preterm infant who has special needs can be difficult and stressful (Treyvaud, 2013). First, the parents need to get through the initial crisis of having an ill newborn (Aagaard & Hall, 2008; Campbell et al., 2012). During this process, positive interactions and the development of a healthy parent-child relationship can be challenging (Forcada-Guex et al., 2006). From a long-term perspective, uncertainties about the child's condition continuously impede the family's return to everyday life (Benzies, Magill-Evans, Hayden, & Ballantyne, 2013; Brett, Staniszewska, Newburn, Jones, & Taylor, 2011; Deatrick, Knafl, & Murphy-Moore, 1999; Graungaard & Skov, 2007; Moore et al., 2013).

Thus, supporting and educating the parents of these infants are important components of the follow-up for these families, both during hospitalization and post-hospital discharge (Benzies et al., 2013; Brett et al., 2011; Kemp & Turnbull, 2014; Peterson, Luze, Eshbaugh, Jeon, & Kantz, 2007; Spittle et al., 2012; Treyvaud, 2013). The parents need help in coping with their situation so that they can reduce stress, improve their self-efficacy and achieve a sense of normalcy with their child in everyday life (Deatrick et al., 1999; Graungaard & Skov, 2007; Pelchat & Lefebvre, 2004; Pelchat, Levert, & Bourgeois-Guérin, 2009; Piggot, Paterson, & Hocking, 2002; Watson, Kieckhefer, & Olshansky, 2006). Health care providers can contribute to these processes (Kemp & Turnbull, 2014; Knafl & Deatrick, 2003; Pelchat & Lefebvre, 2004; Treyvaud, 2013). By attending to the family's uncertainty regarding their situation and responding to the uniqueness of each family and their evolving needs (Deatrick et al., 1999; Jansen et al., 2003; Kruijsen-Terpstra et al., 2014; McLaughlin & Goodley, 2008; Piggot et al., 2002; Watson et al., 2006), health care providers can establish a good parent-provider relationship and help parents to improve their management skills, lower their stress levels, and achieve more positive perceptions of their children's abilities (Kemp & Turnbull, 2014). With regard for physical therapy, parents find that learning how to support their child is helpful (Dusing et al., 2008; Scales et al., 2007). Nevertheless, participation in the therapeutic work with the child can also be perceived as stressful (Dusing et al., 2008; Scales et al., 2007) and may leave the parents with the perception that the child is vulnerable (Bartlett, Nijhuis-van der Sanden, Fallang, Fanning, & Doralp, 2011).

Research indicates that parental coping abilities and healthy parent-child relationships are associated with beneficial outcomes for the infant. While the family is still hospitalized, close parental contact serves to regulate the infant (Shepherd, 2013). Post-hospital discharge, parental learning of positive parent-child interactions and caregiver sensitivity continue to be correlated with better outcomes during infant and toddler ages (Forcada-Guex et al., 2006; Mahoney, Robinson, & Perales, 2004; Treyvaud et al., 2009). Building on this knowledge, the Norwegian national guideline states that health care services for preterm infants should be based on an integrative view of the infant's

cognitive, motor and sensory development and its connectivity to the parent-child relationship (Markestad & Halvorsen, 2007). Accordingly, the PT's focus on motor learning activities and interactions as a means of promoting infant development can also be a valuable tool for building a healthy parent-child relationship. Sensory-motor play is fundamentally the way in which infants explore and learn about the world and their own capabilities in it (Adolph, 2008; Lifter, Foster-Sanda, Arzamarski, Briesch, & McClure, 2011; Lobo, Harbourne, Dusing, & McCoy, 2013; Sheets-Johnstone, 2011). During an infant's first year of life, they continuously explore and use their developing motor skills as they interact with people and surroundings. In these sensory-motor play activities, there is co-activation of motor, cognitive and interactional abilities through which the infants develop their perceptiveness and learn to engage in meaningful activities with others. Thus, sensory-motor play is a driving force for development (Lifter, Foster-Sanda, et al., 2011) that PTs can take advantage of in their therapeutic work to enhance the infant's motor development and support the parent-child relationship.

1.4 Early interventions for preterm infants and their parents – what are the effects?

In recent decades, developmental care and intervention programs aimed at reducing stress, improving infant development and strengthening the parent-child relationship have been implemented in neonatal intensive care units (NICUs) around the world (Campbell et al., 2012). Although evidence of the effects of such programs remains limited, systematic reviews indicate that improvements have been achieved in family outcomes and that positive effects have been observed in infant social, cognitive and motor capacities (Blauw-Hospers & Hadders-Algra, 2005; Symington & Pinelli, 2006; Vanderveen, Bassler, Robertson, & Kirpalani, 2009; Wallin & Eriksson, 2009). Recent publications from Norwegian studies have added to the growing amount of evidence indicating that positive outcomes are gained for both the infant and parents (Landsem, Handegard, Tunby, Ulvund, & Ronning, 2014; Landsem, Handegard, Ulvund, Kaaresen, & Ronning, 2015; Ustad et al., 2016).

Early intervention programs are also administered after the infant has left the NICU. Systematic reviews regarding these post-hospital early intervention programs have looked at positive effects on both motor and cognitive outcomes (Blauw-Hospers & Hadders-Algra, 2005; Hughes, Redsell, & Glazebrook, 2016; Spittle et al., 2012). With regard for motor outcomes, studies have concluded that there are indications of positive effects up until the infants are two years old (Blauw-Hospers & Hadders-Algra, 2005; Hughes et al., 2016; Spittle et al., 2012). Studies that target specific motor skills appear to be more beneficial than generic intervention programs (Hughes et al., 2016). Interestingly, interventions that are primarily aimed at improving a child's motor function have been shown to have positive effects on cognitive outcomes (Blauw-Hospers, De Graaf-Peters, Dirks, Bos, & Hadders-Algra, 2007; Spittle et al., 2012). This indicates that there is connectivity between different developmental domains and underscores the importance of bodily experiences to cognition (Blauw-Hospers et al., 2007; Sansavini et al., 2014). There is stronger evidence for longer-term positive effects in cognitive functions (Spittle et al., 2012). In particular, studies of early interventions focused on parent-child interaction and parental involvement and education have demonstrates that these methods have positive effects on both parents' well-being, parent-child interactions and child development (Benzies et al., 2013; Cioni, Inguaggiato, & Sgandurra, 2016; Kaaresen, Rønning, Ulvund, & Dahl, 2006; Landsem et al., 2015; Norhov et al., 2010; Spittle et al., 2012; Vanderveen et al., 2009). Similarly, sensitivity and synchrony in child-caregiver interactions has been correlated with improved developmental outcomes for the child (Forcada-Guex et al., 2006; Treyvaud et al., 2009).

In summary, while extensive efforts have been made in the development, implementation and documentation of early intervention programs, these programs have not resulted in convincing supportive evidence. Long-lasting positive effect are exceptional, and initial positive effects on child development are usually eliminated by the age of five (Spittle et al., 2012). However, these findings have several limitations, and it remains too early for conclusions to be drawn. First, the lack in evidence is because of the large degree of heterogeneity and quality limitations in existing studies (Spittle et al., 2012). Second, because the effects of being born preterm are unlikely to be completely reversible and early lesions can continue to perturb developmental processes as a child grows, short-term intervention periods and early withdrawal from intervention can also explain the observed diminishing returns on outcomes (Vanderveen et al., 2009). Third, the ethically sound use of standard care instead of non-treatment control groups makes it more difficult to prove statistical significance (Campbell et al., 2012; Hilderman & Harris, 2014). Finally, the lack of evidence regarding motor development may also be the result of the broad scope of interventions and significant variations in intervention design and dimensioning, in combination with the low sensitivity of measurements used to detect changes in motor performance (Orton, Spittle, Doyle, Anderson, & Boyd, 2009; Spittle et al., 2012). Thus, the overall impression that early interventions are unable to provide persistent developmental improvements for the child might not bear resemblance to the truth. It is therefore important to keep in mind that early intervention programs that emphasize the involvement and support of the parents and target specific motor skills for the child do produce both immediate and prolonged improvements in child, parent and family outcomes (Benzies et al., 2013; Landsem et al., 2014; Landsem et al., 2015; Spittle et al., 2012; Vanderveen et al., 2009). Thus, efforts must continue to be made to search for justifiable intervention strategies that are based on an integrated view of the preterm infant's cognitive, motor and sensory development and how this development relates to the infant's interactions with people and their surroundings (Hickman, McCoy, Long, & Rauh, 2011; Lobo et al., 2013).

1.5 Physical therapy for preterm infants and their parents – the current debate

The lack of evidence regarding the efficacy of early interventions is also relevant to the current debate in the field of physical therapy. In parallel with the emergence of the FFC paradigm, there has been a rise in skepticism toward more traditional physical therapy treatment approaches (Hickman et al., 2011). For example, the failure of traditional neurodevelopmental treatment approaches to demonstrate positive effects (Blauw-Hospers et al., 2007; Blauw-Hospers & Hadders-Algra, 2005) has been used as an argument against a hands-on approach. It has been suggested that such approaches contradict the principles of FCC because they are child-focused and involve unidirectional communication with parents (Dirks et al., 2011). Nevertheless, education and support can be provided to parents using a variety of methods and can be categorized as follows: 1) information only, 2) observation and discussion, or 3) active involvement of the parents in interactions with the child, including feedback from the professional (Benzies et al., 2013). Although the effects of these educational strategies remain unclear, several studies have supported the extensive involvement of the parents because this allows them to learn to read and respond to their child's signals and handle him or her in ways that stimulate motor performance (Benzies et al., 2013; Dusing et al., 2008; Dusing, Van Drew, & Brown, 2012; Kaaresen et al., 2006). Noteworthy in this regard is a recently published randomized controlled trial (RCT) in which the parents learned to stimulate their infant using sensitive handling techniques. This method also resulted in significantly better outcomes for the intervention group when tested at 37 weeks GA (Ustad et al., 2016). These findings align with both theoretical

views and empirical findings that address how sensitivity to a child's bodily signals, in combination with individualized and contextually adapted handling, can promote the child's motor resources and enable new movement achievements (Blanchard & Øberg, 2015; Øberg, Blanchard, & Obstfelder, 2014). Thus, categorizing approaches as either hands-on and child focused or hands-off and family-centered might be counterproductive to the pursuit of improving pediatric physical therapy practices. Because positive outcomes have been reported that support both hands-on and hands-off approaches (Arndt, Chandler, Sweeney, Sharkey, & McElroy, 2008; Blauw-Hospers, Dirks, Hulshof, Bos, & Hadders-Algra, 2011), the beneficial elements of both approaches need to be identified and combined to develop new and improved treatment approaches (Hughes et al., 2016; Shepherd, 2013).

2 Study aims and research questions

Based on the FCC philosophy, municipality PTs are expected to deliver high quality, collaborative services for preterm infants and their parents. Current knowledge indicates that infants' motor, social and cognitive skills co-develop via interactions with people and surroundings. Moreover, this development relies on and can be promoted by a positive and healthy parent-child relationship. Therefore, it is suggested that parents need to learn how to handle their child and should be extensively involved in the treatment of their child.

However, there is a lack of knowledge and ongoing debate regarding the benefits and potential unfavorable effects for the infant and parents across physical therapy approaches. Thus, to move forward in the search for improved intervention strategies, we need to know more about how PTs provide their services and customize their therapeutic approach to the needs of the individual preterm infant and parent(s). In this doctoral project, we investigated how municipality PTs conduct their physical therapy services with preterm infants and their parents during the first year post-hospital discharge. We aimed to discover and explore elements in the therapeutic work that were essential to the PTs' successful promotion of infant development, education and support of parents and the promotion of a positive parent-child relationship. The overall research question was:

> What are the interactional keys to success in PTs' family-centered work with preterm infants and their parents?

The subordinate research questions that were addressed in the three included papers were:

1. How do parents perceive physiotherapy in primary healthcare, and how does said perception influence their adaptation to raising a preterm child?
2. In what ways do PTs scaffold and use preterm infants' sensory-motor play engagement in their work to achieve therapeutic goals?
3. How do interactional clinical reasoning (CR) processes unfold and develop in physical therapy for preterm infants and their parents?

3 Theoretical approaches in pediatric physical therapy

Fundamental to this study was an expansion of the theoretical underpinnings of physical therapy for preterm infants and their parents. From the current educational literature we connected to neuroscientific theories that address motor development and learning, the consequences of brain lesions on these learning and developmental processes, and the implications of these theoretical insights for pediatric physical therapy. To advance our knowledge regarding embodied experiences and interactional aspects within the FCC approach, we integrated these neuroscientific perspectives with recent developments in enactive theory. This integrated theoretical perspective has been essential to our comprehension of how PTs can work to promote the preterm infant's development and the parent-child relationship, and to enable parents to be supporters of their infant's development and learning in daily life.

3.1 Infant development and learning

From a historical perspective, advancements in neuroscience have led to changes in how PTs understand and treat infant motor development. Earlier reflex hierarchal and maturation theories served as a basis for therapeutic approaches that were aimed at defeating motor reflex activity and ensuring that motor learning milestones were achieved in what was considered the normal order of development (Campbell et al., 2012; Hickman et al., 2011). In recent decades, these theories have become outdated and been replaced by theories based on the dynamic system theory framework (Campbell et al., 2012; Shumway-Cook & Woollacott, 2012). For PTs, this development involves a shift in focus toward the promotion of motor development via modifications of body, task and environmental factors during the child's daily life activities (Hickman et al., 2011).

A key concept of dynamic system theory is that motor development is a product of the child's active engagement in and exploration of the world (Hadders-Algra, 2000a; Hickman et al., 2011; Smith & Thelen, 2003). Within this dynamic system, there are a range of sub-systems, including body, task and environmental variables, that interact with each other and influence end results (Rochat, 2001; Smith & Thelen, 2003). Thus, there is a vast landscape of developmental opportunities and possibilities that can lead to unique outcomes in individual children (Rochat, 2001). During these interactions, however, principles of self-organization exist in which certain variables become control parameters that constrain other sub-systems and limit the variability of outcomes (Rochat, 2001; Smith & Thelen, 2003). This can explain the coherence and similarity that have been observed during development, both in relation to preterm infants and infants born at term (Bertenthal, 2008; Smith & Thelen, 2003). Different theories within the dynamic system theory framework each highlight certain aspects of the dynamic system of human development and learning. In the following sections, I will present leading theoretical developments in relation to physical therapy for preterm infants and their parents.

3.1.1 Motivation, attention and play

Attention and motivation are driving forces that guide an infant's motor learning and developmental processes. Evidence in neuroscience indicates that there are strong connections between the parts of the neural system that are engaged in motor control and those that actively regulate emotion, attention and motivation (Atun-Einy, Berger, & Scher, 2013; Brodal, 2010; von Hofsten, 2004). Hence, during activities that are important for an individual, focusing attention on the task and expecting some form of reward facilitates the development of functional nervous system circuits and the learning of new behavioral skills (Brodal, 2010; von Hofsten, 2004). For the young infant, explorative sensory-motor play that allows active engagement with the environment can be an appropriate source of motivating,

pleasurable development and learning (Lifter, Mason, & Barton, 2011; Rochat, 2001; Vig, 2007; von Hofsten, 2004). Through these bodily explorations, the infant learns about cause and effect and develops self-efficacy in terms of how their body can be an instrument with which they can make things occur (Lifter, Mason, et al., 2011; Rochat, 2001).

From birth onwards, preterm infants have more frequent problems with attention and responsiveness than are observed in infants born at term, and they risk delays in their sensory-motor play development (Forcada-Guex et al., 2006; Korja et al., 2012; Treyvaud, 2013; Vig, 2007; Wolf et al., 2002). Findings show that caregivers who scaffold and structure the infant's play activities can make them more active, engaged and persistent during play (Childress, 2011; Cress, Arens, & Zajicek, 2007; Mahoney et al., 2004). Transferring this knowledge to PTs' clinical practice, it is suggested that PTs attend to the preterm infant's play abilities both during the assessment of the child and while providing treatment (Lifter, Foster-Sanda, et al., 2011). The infant should be provided with sensory-motor activities that are perceived by the child to be meaningful, in a playful setting and with positive feedback (Hadders-Algra, 2000b). Through these activities, focused attention and motivation can become facilitators that support the achievement of therapeutic goals (Atun-Einy et al., 2013; Levitt, 2010).

3.1.2 The developing neural system

During infancy, major developmental changes occur in both the central and peripheral neural system. As functional connectivities between different regions in the brain gradually improve, more adaptive motor behaviors emerge (Brodal, 2010; Rochat, 2001). These developmental processes are driven by genetically determined neural maturational processes that are also highly susceptible to influence by the environment (Hadders-Algra, 2010). The main features of neural development during the first year involve the initial proliferation of synapses, which is followed by the selective elimination of over-abundant nerve cells and the refinement of the synaptic connectivity of the surviving nerve cell networks (Brodal, 2010; Hadders-Algra, 2010). These processes, including the selective elimination and strengthening of neural connections, are activity- and experience-dependent in that the repeated activation of synapses serves to preserve and reinforce their connectivity, whereas connections that are not activated will deteriorate (Brodal, 2010; Cioni et al., 2016). Thus, the future development of the overall system with its subsystems depends on activity and experiences and how these induce changes in the connectivity and structure of the neural system, muscles and joints (Cioni et al., 2016; Shepherd, 2013). For PTs, this plasticity allows a wide range of potentially use-dependent synaptic connections to be influenced and modified through therapeutic interventions (Shepherd, 2013).

When infants are born preterm, their neuro-motor system is still undergoing these developmental processes. Cortical areas and neural connectivities are therefore still developing. Moreover, myelination is only minimally present at 29 weeks GA, and even at 34 weeks GA, the infant brain is still only 65% of its weight at term (Duerden, Taylor, & Miller, 2013; Kinney, 2006; Shepherd, 2013). Lesions that occur during this early stage can cause cascades of secondary disturbances in the development and maturation of the motor cortex, the corticospinal tract and spinal motor centers (Kinney, 2006; Shepherd, 2013). For example, there are indications that early occurring brain lesions can cause peculiar neural connections to appear that can interfere with normal functions later. Thus, although neural plasticity provides a window of opportunities to perform interventions, it should not be assumed that this plasticity means that lesions are self-reparable. Both the lesion itself and the

therapeutic interventions used to treat it might have unintended, adverse effects on a child's neural developmental (Shepherd, 2013).

3.1.3 Movement variation and complexity

The Neuronal Group Selection Theory (NGST), which was first introduced by Edelman (1987), provides an explanation for how an infant's explorative movement behavior evolves into new and adaptive motor skills. The NGST emphasizes genetic aspects within the dynamic system theory framework and explains how neural development triggers the development and timing of new motor behaviors (Hadders-Algra, 2010). According to the NGST, our neural circuits develop into organized functional networks through genetically determined, yet fine-tuned, dynamic neural selection processes that are influenced by a range of factors related to the child's behavior, experiences and environment (Hadders-Algra, 2000a). As infants start to learn new motor skills, they move from a phase of primary variability, via a selection phase during which the most appropriate motor possibilities are given priority, to the refinement of these selected movement strategies in the phase of secondary variability (Hadders-Algra, 2000a). Ultimately, the end goal is mature, variable motor behavior through which the most efficient movement solutions can be chosen and adapted to different environmental conditions (Hadders-Algra, 2000a, 2000b, 2005; Heineman, Middelburg, & Hadders-Algra, 2010).

From the NGST perspective, children with motor impairments can potentially experience problems in relation to all three phases (Hadders-Algra, 2000b). Children with more severe lesions, which often result in CP, characteristically show little motor variation. According to the NGST, this lack of variation is related to reductions in primary neuronal networks which leave the child with a smaller repertoire of strategies to choose from. During the second phase, children with motor impairments can also have problems selecting the most appropriate solution from their available repertoire. Finally, during the third phase, children (even those with small lesions) can encounter problems when it comes to the refinement and fine-tuning of their selected movement strategies. For PTs in clinical practice, the NGST suggests that interventions should provide more ideal tuning of neural circuits (Fallang, 2004; Hadders-Algra, 2000b). During the primary variability phase, early interventions should be aimed at increasing the range of available neural networks. As the infant moves on to the selection phase, ample movement experiences involving trial and error likely facilitate the process by which the child discovers and selects the most appropriate movement solutions. Finally, during the secondary variability phase, the infant's self-generated active exploration of the selected motor functions under a variety of conditions optimizes the infant's ability to learn adaptive movement behaviors (Hadders-Algra, 2000b, 2010). Infants with neural lesions can be expected to need more practice than healthy infants (Hadders-Algra, 2010) and might benefit from therapeutic guidance as they learn appropriate movement strategies (Dusing & Harbourne, 2010).

3.1.4 The infant's learning-to-learn

Similar to the NGST, the action-perception theoretical perspective also argues that exploratory motor behavior is a pre-requisite for learning and development (Bertenthal, 2008; Von Hofsten, 2007). The key point of this theoretical perspective is that there are strong neural connections between movement and perception (Bertenthal, 2008). Gibson's ecological theory of development (1969) can be viewed as a starting point of these theoretical developments. However, while Gibson emphasized the influence of perception on movement and action, later developments in the field serve to turn this relationship around and focus on how movement and action also shape our perceptibility (Adolph, 2008; Von

Hofsten, 2007). When acting upon the world, the infant simultaneously perceives his or her own body and learns about the properties and affordances offered by his or her surroundings (Adolph, 2005; Von Hofsten, 2007). Furthermore, these action-perception experiences are also cognitive processes; this learning about movement goals, possibilities and constraints improves the infant's ability to plan, judge and predict the outcomes of actions (Adolph, 2008; Adolph & Robinson, 2015; Bertenthal, 2008; von Hofsten, 2004).

To understand the consequences of this theoretical perspective for pediatric physical therapy, I will focus on Karen Adolph's descriptions of how the principles of action-perception theory can explain infant explorative gross motor behaviors and learning processes (Adolph, 2008; Adolph & Robinson, 2015; Adolph, Robinson, Young, & Gill-Alvarez, 2008). According to Adolph, infant explorations and interpretations of perceptual experiences involve 'learning-to-learn' about how to move within and adapt to different contexts and constraints (Adolph, 2008). Through action-oriented, problem-solving learning-to-learn processes the infant learns to perceive, take risks and make probability assessments related to imposed posture and movement challenges (Adolph, 2005). Once the infant becomes experienced with a particular motor skill (e.g., crawling), it is easier for him or her to adapt to novel surroundings and challenges. Thus, an experienced infant will make fewer errors, and (s)he will be more accurate than a novice in prospective assessments of which tasks can be accomplished successfully and which should be avoided (Adolph, 2008; von Hofsten, 2004). In sum, the action-perception perspective holds that infant motor learning is founded on trial and error movement experiences, which must be provided in extensive doses via a variety of contexts and distributed across time (Adolph, 2005; Hickman et al., 2011). To learn adaptive motor skills, infants need ample opportunities to explore their environment and their range of possible movement strategies (Adolph, 2005; Hickman et al., 2011). Thus, facilitating action-perception via a variety of experiences with objects and physical surroundings becomes a driving force through which infants can discover, select and refine their movement strategies (Adolph, 2008). These learning principles align with the recommendations based on the NGST and are applied as arguments favoring high volumes of task-specific activities in a meaningful context in early intervention (Hickman et al., 2011).

3.2 Enactive theory – Interaction, embodiment and clinical reasoning

Our current knowledge about preterm infant development and learning clearly indicates that preterm infant motor learning relies on the presentation of extensive and varied opportunities for active movement exploration of both their environment and the potential of their own body (Adolph, 2008; Dusing & Harbourne, 2010; Hadders-Algra, 2000b). In this study, we contextualize these learning principles to the clinical physical therapy setting and explore the infant's motor learning in interaction with both people and surroundings. We want to understand how PTs can collaborate with parents toward the provision of interactive, engaging and repeated motor learning opportunities in the preterm infant's everyday life. To address these questions and expand our comprehension of embodied and interactional aspects of physical therapy, we relate the current neuroscientific knowledge about infant learning and development with the enactive theoretical perspective.

The enactive approach was introduced by Varela, Thompson, and Rosch (1991) and continues to develop (Di Paolo et al., 2010). Based on the merging of theoretical insights from dynamic system theory, neuroscience and phenomenology of the body, the enactive approach offers a new and alternative perspective on how embodied actions, interactions and experiences form the core of our cognition and understandings of the world. Similar to the action-perception perspective, there is a shift in focus away from theories that explain cognition as individual acts of incoming information processing to a recognition of how we understand our world through our enaction with it. The core idea of enactive theory is 'cognition as embodied action', which is based on the following five principles: 1) autonomy, 2) emergence, 3) experience, 4) embodiment and 5) sense-making (Di Paolo et al., 2010; Thompson, 2005) (view textbox for details).

3.2.1 Enaction and infant development

A key feature of the enactive theoretical perspective is an emphasis on the developmental processes of cognition rather than more traditional descriptions of mechanisms in relation to adult cognition (Reddy & Morris, 2004). Thus, enactive theory sheds light on how the young infant can explore, learn and develop through interactions with the world.

The enactive approach is inclusive of neuroscientific and phenomenological insights and current evidence indicating how

Autonomy refers to the driving force behind any organism's need to maintain itself and its identity as a stable, interactive system in an unstable, precarious environment (Di Paolo, Rohde, & De Jaegher, 2010). The principle of autonomy applies to both basic life-maintaining functions as well as more sophisticated activities, such as interactions with others and one's surroundings.

Emergence accentuates how our properties and capabilities as living beings grow out of complex dynamic interactions that occur both within the organism itself and in cooperation with the environment (De Jaegher & Di Paolo, 2007). This notion holds that infant development is a result of the emergent processes of such interactions. As we engage with our surroundings, our development and learning is shaped by constraints and modulators within these dynamic interactions (De Jaegher & Di Paolo, 2007).

Experience is central to comprehending of our way of being alive in this world. Experience encompasses what molds us as individuals in addition to the grounding of the transformation we go through during the acquisition of new skills. Similar to the action-perception theoretical perspective, this notion assumes that the learning and refinement of skills depends heavily on appropriate, extensive experimenting (Di Paolo et al., 2010).

Embodiment is at the core of the enactive view of cognition as embodied action. It is as embodied beings that we engage with the world, and our body is therefore not only a medium through which experiences are relayed or actions are performed. Instead, cognition resides in the body as much as in the brain (De Jaegher & Di Paolo, 2007). As we engage with our world, our bodily encounters and experiences occur simultaneous to our cognitive experience of the situation. Vice versa, as we cognitively feel or do something, it is simultaneously felt and acted in the body.

Sense-making explains how we, as living organisms, perceive the significance of our surroundings. In accordance with our needs and desires as living beings, we bring with us a certain perspective – a web of significance – that defines what brings meaning to us and how we make sense of our world. Thus, sense-making is an active and interactive process by which our perceptions of ourselves, others and the world, which are amalgamated with previous experiences and future expectations, emerge and develop (De Jaegher & Di Paolo, 2007).

our bodies shape our central nervous system and its connectivity. According to Gallagher (2005), embodiment shapes our minds in both general and highly specific ways. At the general and fundamental level, he suggests that "bodily movement, transformed onto the level of action, is the very thing that constitutes the self" (Gallagher, 2005, p. 9). Accordingly, the ways we perceive of our world and our actions in it are not based on isolated in-the-brain cognitive processes that involve sensory feedback. They are instead based on active and ongoing perceptions of events during which we, as embodied beings, interact with our environment (Gallagher, 2005). This notion involves the active organization of both the input and output neural processes, by which our cognitive awareness depends on our intentions and the saliences of the given situation (Gallagher, 2005).

At the specific level, embodiment, in terms of bodily founded neural processes, provides the individual with both non-conscious and conscious perceptions of the self (Gallagher, 2005). Within these bodily perceptions, Gallagher differentiates between the terms body schema, which largely represents non-conscious neurological brain-body structures and processes, and body image, which describes the more conscious perceptions of our body. Furthermore, our awareness of bodily actions involves both a sense of agency, i.e. an awareness that I am the one who is (or is not) performing an action and a sense of ownership, i.e. an awareness (or lack thereof) that it is my body that is involved in an action (Gallagher, 2005). In sum, these perceptual structures and experiences are constitutive to our comprehensive embodiment of the world (Gallagher, 2005). Nonetheless, these experiences and intermodal sensing of the world are innately coupled with the environment (Rochat, 2001) in that we experience ourselves only as in relation to others and our surroundings (Gallagher, 2005; Zahavi, 2004). Thus, as movement occurs, body perceptions are compared to sensory input from the environment, and these two inputs combine to verify what is moving – my own body, something or someone in the environment, or a combination of the two (Gallagher, 2005). Moreover, the infant's own volition to perform a motor act also involves the perception that a movement is self-produced as opposed to induced by something or someone else (Zahavi, 2004).

For the young infant, movements and proprioception that are present early in prenatal life are fundamental to the emergence of consciousness. As Gallagher says: "whenever consciousness begins, it will already be informed by embodiment and the processes that involve motor schemas and proprioception" (2005, pp. 78-79). Based on this idea, we can envision a primary embodied self that is present at early infancy. Onward from that point, movement explorations and experiences provides the infant with input that serves the continuing emergence of the body schema, body image and self-awareness (Gallagher, 2005). This may explain the attention that infants pay to their own bodies. Their repetitive, playful engagement in motor activities can be viewed as the development and refinement of their proprioceptive awareness and may represent their learning about their embodied self as an agent in the world (Rochat, 2001). Rochat (2001) emphasizes the private nature of this self-explorative behavior in that he claims that infants often prefer to engage in these activities by themselves to differentiate themselves from their environment. However, when it comes to playing with objects, recent research indicates that infants as young as three months age share their play experiences with others (Rossmanith, Costall, Reichelt, López, & Reddy, 2014). During the next few months, their ability to play and interact continues to co-emerge and co-develop until they at around nine months age are fully able to combine their focus with that of a social partner to pay attention to an object in the environment (Rossmanith et al., 2014). This supports the view that the development of sensory-motor play skills and interactional skills are interconnected rather than separate processes (Bigelow, MacLean, & Proctor, 2004; Rossmanith et al., 2014). In sum, the enactive approach holds that young

infants are interactors within their world and that their motivated sensory-motor play enables them to discover and explore both their own movement capabilities and their ability to engage with objects and people in their surroundings.

3.2.2 Interaction, cooperation and co-creation of meaning

The enactive view is based on the notion that our human way of making sense is deeply embedded in our interactions with others and the world. In a societal context, interaction is essentially the co-creation of meaning in a socio-cultural setting with contextually inherent norms and expectations (De Jaegher, Peräkylä, & Stevanovic, 2016). This connects back to the core principles of enactivism because each individual then brings his or her autonomy, identity and designated role to these social encounters. With this autonomy comes an inherent vulnerability, in that a lack of engagement or interest, misconceptions and differences of opinion by the participants can jeopardize mutuality and the co-creation of meaning (De Jaegher et al., 2016; Di Paolo & De Jaegher, Forthcoming).

This interactional co-creation of meaning builds on the concept of enactive intersubjectivity, in which social understanding is explained as a dynamic process of participatory sense-making and mutual incorporation (Fuchs & De Jaegher, 2009). As was previously noted, sense-making is an active act of engagement that arises as we enact our world. When this enactment occurs during interactions with others, the two (or more) involved embodied agents engage and coordinate themselves in a process of participatory sense-making**.** In this dyadic engagement, a circular dynamic arises as the interaction proceeds. Based on their mutual attention, the participants unconsciously coordinate their movements, and their perception-action processes couple and interlace with each other (De Jaegher & Di Paolo, 2007). This coordination drifts along a scale of unilateral coordination by one participant to that of the other (indicating more of an individual sense-making process) and both participants' co-regulated coordination with each other (in a perfectly mutual sense-making process). In addition, the interaction process itself can gain a 'life of its own' and might consequently play the lead role in the participants' engagement and sense-making processes.

The notion of mutual incorporation (Fuchs & De Jaegher, 2009) provides further insight into this dyadic bodily interplay of intersubjective understanding. This notion implies that it is the body itself that is the 'center of gravity' of an individual's intentionality during interactions with others. When two bodies enter into an interaction, they each bring their own intentional center of gravity into the dyad. During the interaction, these two centers will regulate each other via a continuous oscillation "between activity and receptivity, or 'dominance' and 'submission'" (Fuchs & De Jaegher, 2009, p. 476). Again, this time in phenomenological terms, the interaction process might gain a life of its own by developing its own intentionality center. In this way, the 'in-between' becomes a source of operative intentionality for both partners (Fuchs & De Jaegher, 2009), and each agent's actions are thereby affected by and can affect the other. Mediating eye contact, performing facial expressions, using one's voice, touching, gesturing and other kinds of intentional actions enable this coupling and development into a dyadic bodily state. The participants' "body schemas and body experiences expand and, in a certain way, incorporate the perceived body of the other" (Fuchs & De Jaegher, 2009, p. 472). Similar to the distinction between coordination to and coordination with, this incorporation can be either unidirectional (e.g., when using a tool or, as a contemporary example, a smart phone or tablet) or a mutual incorporation of embodied interactions between living beings. During this mutuality, both agents are active in their perceptions and responses to the other, with varying degrees of coordination and synchronization (Fuchs & De Jaegher, 2009).

In summary, enactive intersubjectivity describes the view that social understanding is "an interactional and intercorporal process during which both partners are immersed and in which the process of interacting itself plays a lead role" (Fuchs & De Jaegher, 2009, p. 470). Notably, this intersubjective understanding does not depend on verbal expressions. It is instead accessible through the perception of the other's intentions as expressed through their actions. Furthermore, the interaction process itself can and will continuously both generate and transform the interactors' intentions and actions. Intersubjective understanding is therefore a two-way interactional process that involves "perceiving and being perceived, acting and being acted upon" (Fuchs & De Jaegher, 2009, p. 477). In relation to clinical practice, therapeutic encounters are indeed intersubjective and interactional events during which the PT, infant and parent(s) must coordinate their actions and cooperate toward mutual, meaningful goals. This cooperation consists of embodied, contextually meaningful interactions during which the subjects take the other's interests and intentions into account and act to complement the other's responses (Fantasia, De Jaegher, & Fasulo, 2014). For the young infant, these bodily cooperation abilities serve as a foundation that supports the emergence of new skills across developmental domains. Via bodily expressions and engagement, young infants are able to cooperate with others, and their development depends on it. Cooperation is fundamentally the mode of being with others, and it is therefore the framework on which development occurs. Simultaneously, as new skills develop, the infant is provided with new cooperative possibilities (Fantasia et al., 2014). In line with the dynamic nature of intersubjectivity, cooperation is also a fluctuating phenomenon. Interactions can move across gradients of mutual coordination and incorporation, and the momentum of the interactional process itself can attain a leading role for the participants. As a consequence, cooperation can be either more or less successful and is conditioned by the participators' sensitivity and responsiveness to each other and the interaction (Fantasia et al., 2014).

3.2.3 Embodied-Enactive Clinical Reasoning

These enactive views of our being in the world as embodied-cognitive agents have consequences not only for how we perceive infant development but also how we understand the role of the pediatric PT during the enactive processes of development and learning for the preterm infant and parent(s). At the core of this role is the PT's clinical reasoning (CR), which occurs before, during and after therapy sessions. Traditionally, CR in pediatric physical therapy is described as a hypothetic-deductive process (Kenyon, 2013) that is founded on the principles of FCC (Furze et al., 2013; Goldstein, Cohn, & Coster, 2004; Jensen, Gwyer, & Shepard, 2000; G. King et al., 2007). This notion holds that the PT assesses the child's condition and the family's situation; develops a hypothesis about the child and the family's resources, impairments and therapeutic needs; and proceeds with further assessments and interventions that confirm, adjust or reject the working hypothesis (Edwards, Jones, Carr, Braunack-Mayer, & Jensen, 2004). However, there has been increased attention toward the multidimensional nature of CR and how the expert practitioner manages the artistry of his/her profession by taking narrative, interactional, collaborative and ethical aspects into consideration (Edwards, Braunack-Mayer, & Jones, 2005; Edwards et al., 2004). These interactional aspects are emphasized and explained by the concept of embodied-enactive CR (Øberg, Normann, & Gallagher, 2015), which specifically addresses the PT's ongoing CR-in-interactions during the clinical session. While CR does include higher-level cognitive processes, such as hypothetic-deductive reasoning, embodied-enactive CR incorporates the notion that there are also more intuitive, underlying processes in embodied interactions that inform and govern the PTs' CR-in-interactions. In accordance with the principles of enactive intersubjectivity, cooperation and co-creation of meaning, the PTs' CR is informed by the processes of mutual incorporation, coordination and sense-making as they interact with patients.

Based on embodied, joint attention and communication about ongoing therapeutic activities, the PT gains insight into the patient's abilities, engagement, compliance and learning processes. In relation to the pediatric field, this embodied-enactive CR will involve complex, triadic interactions with both the child and parent(s).

4 Methodology and methods

In this study, we investigated the field of pediatric physical therapy with emphasis on enactive theoretical perspectives to explore and understand the collaborative work to promote infant development and learning. The study resides within a qualitative, hermeneutic research paradigm that is based on the core understanding that scientific inquiry is an interactive and interpretive process through which study participants, researchers and, eventually, readers influence the research process and the knowledge gained from outcomes (Blaikie, 2007; Creswell, 2007; Malterud, 2016). Our approach was innovative in that we are not familiar with other studies in which the enactive approach has been applied in qualitative studies with empirically collected data from a health care setting. However, we found support for our approach in that the enactive approach is inherently trans-disciplinary in nature and welcomes research that can illuminate multiple aspects of this theoretical stance (Di Paolo & De Jaegher, 2015).

The participants' own embodied experiences and actions are valuable sources of knowledge (Blaikie, 2007; De Jaegher & Di Paolo, 2007). To get access to these actions and experiences, we observed the clinical encounters between the PTs, infants and parents. In addition, we interviewed the PTs and parents to obtain their verbal accounts of their experiences and actions. Thus, the knowledge developed during this study came about as a result of our efforts to grasp the experiences and actions of the participants and interpret them systematically with regard to their context. This allowed us to maintain a continuous dialogue between our research questions, the data material and our theoretical perspective. In the following presentation of the study methods and the subsequent methodological considerations, I aim to provide a reflexive account of how we as researchers, in our interactive research process with the study participants, have developed and influenced the knowledge outcomes of this study.

The hermeneutic ideal involves acknowledging the researchers' roles as instruments during the process of obtaining and analyzing data (Malterud, 2016). This observer dependence on behalf of the researcher is also emphasized in enactive methodological descriptions, not as a problem to overcome but rather as an opportunity for the observer to discover and co-create new insights together with the observed (Reid & Mgombelo, 2015). Both before and during data collection, researchers influence the content and development of the material via their decisions and pursuance of relevant and engaging issues. In addition, researchers select and apply theoretical perspectives to understand the phenomenon being studied (Malterud, 2001). These connections to theory serve to sharpen focus during the interpretation and emerging of new knowledge (Malterud, 2016). In our study, the choice of theoretical framework originates from phenomenological insight of how we reside in, perceive of and act upon our world as embodied beings. However, this phenomenological perspective is not sufficient. To understand PTs' clinical practice we also needed to connect to neuroscientific evidence on infant learning and development. In enactive theory, we found a merging of these perspectives and an orientation toward social interaction and co-creation of meaning which served to sensitize us in our investigation of the PTs' FCC work with the preterm infants and their parents. It became the framework within which we observed and engaged with the field of study and through which we interpreted our collected data.

4.1 Study design

In alignment with the study's aim of exploring successful interactional elements in physical therapy with preterm infants and their parents, we designed our study with video recorded observations of clinical sessions in addition to individual interviews with the PTs and parents after sessions. This combination of sources enabled our first-person observations of actions and interactions during therapy in addition to the participants' own reflections regarding physical therapy for the preterm infant.

Video recorded observations enable the phenomenon under study to be investigated within its natural situational circumstances (Heath, Hindmarsh, & Luff, 2010). We viewed the clinical encounters as complex and interactional constellations to which the PT, infant and parents all contributed their individual experiences, actions and skills. Thus, it was important to obtain first-person, contextualized access to these interactional events. Because we also wanted to obtain the participants' verbal accounts of their experiences, descriptions and beliefs (Kvale & Brinkmann, 2009), we interviewed the PTs and parents regarding the observed situations as well as their more general views regarding the content and conduct of physical therapy for the preterm infant. We chose to conduct individual interviews with the PTs and the parents to obtain access to both participants' perspectives and allow them to express their interests, opinions and experiences in confidentiality with the researcher.

The study had a longitudinal design that included researcher visits when the infant was approximately 3, 6 and 12 months of age in each infant-parent-PT triad. By following each infant-parent-PT over time we were able to develop trust and rapport with the participants and got to observe and discuss how their infant-parent-PT interactions developed over time and across the infant's different developmental stages. Initially, we also requested that the parents create a video diary of everyday care and play situations. This protocol was discontinued at an early stage because the parents reported that it was time-consuming and difficult to accomplish because of practical considerations in their everyday life.

4.2 Study context

Norway is a western society with well-developed health care and social security systems (The United States Social Security Administration, 2016; WHO, 2000). The availability of good quality health care results in a lower than average number of infants born preterm. Approximately 7,5% (Markestad & Halvorsen, 2007) of infants are born preterm in Norway, whereas the worldwide average is 10% (Institute of Medicine Committee on Understanding Premature & Assuring Healthy, 2007). Nonetheless, the increased availability of care is also associated with higher survival rates in infants born preterm, which comes with an elevated risk of neurodevelopmental impairments and a consequential need for health care services (Markestad & Halvorsen, 2007). For the family, access to social welfare enables one of the parents to be the daily caretaker of the preterm infant throughout the first year of life. During hospitalization, the parents commonly receive care benefit payments and stay at the hospital together with their infant. Post-hospital discharge, paid maternal or paternal leave enables most families to stay home with their infant during the first year.

Physical therapy services are regulated by law and available to the general public as both a treatment and a preventive service (Helse- og omsorgsdepartementet, 2011). Although the law determines the existence and general criteria for these services, each municipality develops the dimensions, priorities and guidelines for their implementation of services (Helse- og omsorgsdepartementet, 2011).

Typically, preterm infants who show signs of motor impairments will have easy access to physical therapy in their municipality. A PT's individual assessment of both the infant's and the family's needs determines the content, frequency and duration of the service. In some municipalities, physical therapy is also provided as a preventive service for VLBW or extremely preterm infants, even when they do not display signs of motor impairments (Stavanger kommune, 2006). Because parents usually stay home during the first year of an infant's life, they have the opportunity to develop a close collaborative relationship with their PT. Thus, municipality PTs often play a central role for families with preterm infants because they provide counselling for the parents and they monitor and support the infant's developmental progress.

4.3 Recruitment and study participants

Our study of physical therapy in the municipalities included a purposeful sample of seven preterm infants with their parent(s) and PTs. Recruitment occurred among families who were already enrolled in the RCT Norwegian Physiotherapy Study in Preterm Infants (NOPPI), which was administered at three Norwegian hospitals and included infants born preterm at ≤ GA of 32 weeks (Øberg et al., 2012). In NOPPI, parents were trained to perform interventions on a daily basis, with an emphasis on the individualized stimulation of the infant to optimize motor performance and development. The inclusion criteria of the preceding RCT were the following: 1) infants born at GA ≤ 32 weeks who tolerated handling at 34 weeks' PMA and 2) parents understood and spoke Norwegian. The exclusion criteria were triplets and higher pluralities, infants with malformations or syndromes and infants who underwent major surgery (Øberg et al., 2012). The additional criterion to participate in this study was that the infant was referred to physical therapy services in their municipality. This referral was based on findings from an in-hospital clinical examination of the infant that was analyzed in combination with the results of standardized tests[1]. In some instances, the infant's GA/ LBW was sufficient ground for a referral to physical therapy in the municipality as a preventive measure.

The infants and parents were recruited by the PTs at three Norwegian hospitals. Recruitment occurred either upon discharge from the hospital or when the family returned to their outpatient controls at three and six months CA. The hospital PTs distributed written information (appendix 2) about the project to eligible families. The parents then returned an informed consent document to the PhD candidate via regular mail. At this point, the PhD candidate contacted the family and obtained the contact information for the family's municipality PT. Next, the PhD candidate contacted the municipality PT and provided written information about the study (appendix 3). The PTs gave their consent via e-mail

[1] TIMP: The Test of Infant Motor Performance is a test of functional motor behaviors in infants that is used in special care nurseries and early intervention or diagnostic follow-up settings. It assesses the postural and selective control of movement that are required for functional motor performance in early infancy (Infant Motor Performance Scales, 2016).
AIMS: The Alberta infant motor scale is an observational measure of infant motor performance. It assesses the infant's sequential development of motor milestones from term to independent walking in four postural positions: prone, supine, sitting and standing (Piper & Darrah, 1994).
GMA: The General movement assessment is a new, non-intrusive and cost-effective method of functionally assessing the young nervous system to identify any neurological deviations that could lead to CP and other developmental deficits later in life (General Movement Trust, 2009).

or regular mail. Initially, the parents of 11 infants gave their participation consent. One of these was excluded because physical therapy was discontinued shortly after consent was provided. For three more infants, the PT declined to participate.

Therefore, a total of 7 infants (including one set of twins), their parents and their PTs were eventually included in the study. Six of these infants were the parents' first child, whereas one was the second child. One of the infants started in day care before 12 months of age, and the rest of the infants had one parent available as a daily caregiver throughout the study period. Nine parents participated in the study, and all of the mothers and three fathers were represented. The infants' medical conditions and developmental statuses ranged from those with no apparent problems to infants with severe respiratory problems and CP. More information about the participants is provided in Table 1. Based on the information available about the participants, the study sample is considered to represent a variety that is commonly observed for this group of patients in the Norwegian context.

Table 1: Information about participants

Infant's medical history/ motor development	**Intervention**	**PT background and experience**	**Infant age at researcher visits**	**Parents' presence at researcher visits**
Born at 29 weeks GA, diagnosed with CP at 6 months old.	1 per week at PT's workplace	5-15 years, mostly with children 0-18 years old.	5, 7 and 14 months	Sessions 1-3 with Mom.
Born at 24 weeks GA. Typical motor development, minor deviations in movement quality.	1 per month at the family's home	5-15 years, mostly with children 0-18 years old.	8, 9 and 12 months	Sessions 1 and 2 with both parents. Session 3 with Mom only.
Born at 28 weeks GA. Delayed motor development.	1-2 per week at the family's home	< 5 years, patients of all ages.	4, 6 and 12 months	Sessions 1 and 3 with Mom. Session 2 with Dad.
Born at 28 weeks GA. Delayed motor development during infancy, age-adequate at 12 months CA.	1-2 per week at the family's home	< 5 years, patients of all ages.	4, 6 and 12 months	Sessions 1 and 3 with Mom. Session 2 with Dad.
Born at 26 weeks GA. Delayed motor development during infancy, age adequate at 13 months CA.	1 per week to 2 per month at the family's home	15 years +, mostly with children 0-18 years old.	3, 8 and 13 months	Sessions 1-3 with Mom.
Born at 29 weeks GA. Typical motor development, minor deviations in movement quality.	1 per month at the PT's workplace	5-15 years, recent years with children 0-18 years old.	3 and 6 months	Sessions 1-2 with Mom.
Born at 27 weeks GA. Delayed motor development during infancy, age-adequate at 13 months CA.	1 per week at the PT's workplace	5-15 years, recent years with children 0-18 years old.	6, 9 and 13 months	Sessions 1 and 2 with Dad. Session 3 with Mom.

4.4 Data collection

In preparation for data collection, a pilot study with one observation, together with PT and parent interviews, was conducted. This provided input into how to proceed with the video recordings and resulted in minor adjustments to the observation and interview guides (appendix 4-6). The pilot participants confirmed that they felt comfortable being observed, and they expressed that the interviews enabled them to reflect on their own experiences and easily voice their own thoughts and opinions.

The data collection period was from December 2012 to November 2014. The PhD candidate visited each infant with his or her parent(s) and PT three times during the infant's first year post-hospital discharge. Occasional delays in the recruitment process led to a wide age range in the infants at the time of the first visit (from 3 to 8 months CA). The third visits were all conducted when the infants were 12-14 months CA. Because physical therapy was stopped in one infant-parent-PT triad, that group was visited only twice. Thus, a total of 20 visits were completed. At each visit, the PhD candidate observed and video recorded the physical therapy session and subsequently conducted individual interviews with the parent(s) and PT. After each visit, the PhD candidate made a summarizing text including their overall impressions from the observation and interviews. This included a content summary, researcher reflections and an evaluation of the data collection strategy. These documents were included as part of the data material and were reviewed in preparation for the second and third visits.

4.4.1 Observation and video recording

Physical therapy sessions occurred either in the family's home or at the PT's workplace. Floor space was always available and was the natural site to conduct the therapy. It was important to ensure that the participants were well informed and comfortable about the situation (Heath et al., 2010). The PhD candidate explained the purpose and confidentiality of the video recordings and encouraged the participants to proceed with their session as usual at the beginning of the first session. They were also reminded about these points at the second and third visit. The mean duration of the sessions was 33 minutes, with a range from 21 to 54 minutes. The main themes of the observation guide (appendix 4) were 1) the treatment setting, 2) the content of the physical therapy, 3) PT-infant-parent interactions, and 4) changes in the infant's function during sessions.

During the sessions, I acted as a silent observer and video recorded the clinical encounters using a hand-held camera. To achieve good observations and video recordings, practical considerations were made (Heath et al., 2010). Because I wished to be mindful to not obstruct the natural treatment setting, I made no request for alterations in the room. It was important to remain in the background and not cause any disturbances but to remain able to observe and video record ongoing PT-infant-parent(s) interactions. I strove to obtain a good angle to view the ongoing interactions, to maintain proper backlighting for the camera, and to simultaneously stay out of the infant's line of sight. The angle and focus of the camera were monitored and adjusted when needed. As a general rule, capturing ongoing interactions between the PT, infant and parent(s) within the camera viewing field was a priority. Thus, the inclusion of participants on film varied relative to their inclusion and involvement in the ongoing actions. Occasionally, I zoomed in to capture details of handling techniques, infant responses and communication between the infant, PT and parent(s).

The presence of a researcher is likely to have influenced the participants' conduct (Heath et al., 2010; Taylor, Bogdan, & DeVault, 2015). At younger ages, the infants appeared to take little notice of the

researcher. As they grew older, they became more attentive and initiated social contact and interactions, including facial mimicking and the sharing of toys. On these occasions, I gave a positive response and withdrew from the interaction as soon as possible. Some of the PTs indicated that they were nervous about being observed, and I encouraged them to not feel that this was an evaluation of their performance. At the onset of the sessions, all of the PTs were attentive toward the researcher's presence but paid less attention to the researcher's presence as the sessions proceeded. During debriefing, the PTs confirmed that they quickly forgot about my presence and conducted the physical therapy session as usual. However, one set of parents commented that the PT was more attentive toward them when the researcher was present. The parents were slightly more cautious about the researcher's presence. First, they did not want to block the view of video camera, and they seemed to believe that the PT and infant were the focus of the researcher's interest. Thus, I sometimes stated to the parents that they should not hesitate to involve themselves in the situation as the usually would. Nonetheless, according to the PTs, there were still instances in which the parents were less talkative and involved than usual.

4.4.2 Interviews with PTs and parents

The interviews were semi-structured and involved the use of a conversational style to open up the participants' choice of topics and free expression of thoughts and opinions (Kvale & Brinkmann, 2009). During the conversations, I asked probing questions to confirm my comprehension of the participants' stories and statements. Toward the end I made a verbal summary of our conversation and encouraged the participants to confirm, correct and add information to this summary. The included guides for parent and PT interviews (appendix 5 and 6) were used across all three visits. Thus, not all of the topics needed to be addressed within one interview. While preparing for the second and third visits, the previous interviews were reviewed to clarify which parts of the interview guide had yet to be covered and to prepare follow-up questions to clarify or elaborate on topics identified during the previous conversation. The longitudinal design allowed for the intertwining of data collection and analysis, and individual preparations were made for each follow-up interview. This approach enabled me to 1) follow the individual story line, 2) investigate phenomena that appeared across interviews, and 3) focus on questions and topics that developed during the early analyses (Hilden & Middelthon, 2002). All but one interview occurred after the observation of a physical therapy session. The order of interviews with the parents and PTs varied from visit to visit and depending on timing and the practicality of travel for the PT, the parent(s) and the researcher. All of the interviews were audio-recorded.

4.4.2.1 Parent interviews

The interviews with the parents were conducted in either the family's home or a private setting at the PT's workplace and either immediately after the therapy session or following the interview with the PT. The interview guide (appendix 5) consisted of five main topics: 1) talking about the child, 2) today's physiotherapy session, 3) physiotherapy in general, 4) experiences from birth to the present time, and 5) future priorities. The typical duration of the interviews was 50-60 minutes and ranged from 19 to 89 minutes, depending on how much time the parent(s) had available. On one occasion, the parent interview had to precede the therapy session. This was solved by talking about more general issues up front and dedicating an additional 10 minutes afterwards to talk about the session of the day.

Of the 17 (counting twin parents once) interviews that were performed with the parents, 11 were conducted with mother only, 3 were conducted with the father only, and 3 were conducted with both parents present. However, we did not evaluate gender differences in our analysis of the data.

Nonetheless, the variety of interview settings provided us with nuanced data material (Kvale & Brinkmann, 2009) that included explorations of both individual and mutual parent experiences as well as both the mothers' and the fathers' perspectives.

The parents were open-minded about being interviewed. They shared their experiences with having a preterm child and verbalized their own needs and their perceptions of the care they had received from various service providers. Nevertheless, they were cautious about conveying negative experiences regarding the physical therapy they were currently receiving. I emphasized that any criticism would be confidential, handled respectfully and viewed as constructive and a means for improving physical therapy services. As trust and rapport developed, the parents revealed more of their dissatisfaction during the second and third interviews.

4.4.2.2 PT interviews

All of the interviews with the PTs were conducted at the PT's workplace either immediately after sessions or following the interview with the parents. The PTs provided a private area at their workplace, and very few interruptions occurred. The interview guide (appendix 6) lists the following five main topics: 1) today's session, 2) impressions of the child, 3) physiotherapy with the child, 4) collaboration with the parents, and 5) the PT's background. The duration of the interviews ranged from 22-76 minutes and had an average of 52 minutes. All but four of the interviews lasted for 36-63 minutes.

The interviews evolved in diverging directions. Some of the PTs were eager to discuss movement analysis and the relationship between their clinical practices and recent theoretical updates, while others were more focused on the interactional aspects of their therapeutic work. In addition, the PTs introverted and extroverted personalities influenced their willingness to elaborate on their experiences and opinions. Hence, I needed to adjust the interview techniques accordingly by sometimes asking more direct questions to elicit an answer, while at other times sharing more of my own thoughts and reflections to keep the conversation going. Some of the PTs also expressed that they were nervous about being interviewed. I encouraged them to view it as an opportunity to reflect on their role as the PT for this particular child and family rather than a test of their knowledge and skills. During the debriefing, all of the PTs expressed their relief and confirmed that the interviews had a relaxing atmosphere that enabled them to speak their opinions and reflect on their own performance as a PT.

4.5 Data analysis

As recruitment to the study extended over time, the data collection and preliminary analyses periods overlapped. Consequently, the topics that developed in the preliminary analyses shaped the focus and fields of interests of subsequent data collection. This is viewed as a beneficial process because the researcher is sensitized towards themes and issues and can accordingly maximize the relevance of new recordings (Heath et al., 2010).

All of the data was analyzed using traditional qualitative method procedures in which the coding, categorization, interpretation and representation of the data were central steps (Creswell, 2007). Our procedure adhered to the four steps of the systematic text condensation approach that was described by Malterud (2012). These are listed in the flowchart below and described as follows: 1) total impression (A and B), 2) coding, 3) condensation and 4) synthesizing (A and B). Nvivo 10 (QSR International Pty Ltd, 2012) was used as the sorting tool to code and sort the data. While the analysis procedures can easily be perceived as linear, it was performed in real-time as an iterative process with alternations

between performing steps and continuously checking our interpretations against the data material that was collected. Using this method, we moved through the coding faces with which the data was de-contextualized toward a re-contextualization of our findings in accordance with the overall impressions of the data material as well as relevant theoretical perspectives. The PhD candidate had the lead role in the analytical processes and reviewed and discussed the findings in regular meetings with the supervisors. In the following sections, I present the general procedures used to perform the analyses of the interviews and observations. For more details about the individual analytical process, I refer the reader to paper I-III. Total impression A includes the preliminary phase of the analyses, during which a review of the overall impressions from each visit enabled the inductive emergence of interesting topics from the data. As these topics were sorted, they fell into three categories, and these served as the foundation for our selection of the data material that was analyzed for each of the papers.

Total impression A		
A text with overall impressions was written after each research visit. A review of these notes resulted in ideas for preliminary topics of interest. The preliminary topics were sorted into three main topics.		
⇩ Total impression B		
Preliminary topic Paper I: The parents' perceptions of physical therapy. Interviews with parents were selected. Overall impressions from these were reviewed in more detail.	Preliminary topic Paper II: Mutuality in attention and action during therapy - on the premises of the child. Observations of treatment sessions were selected. Overall impressions from these were reviewed in more detail.	Preliminary topic Paper III: Clinical reasoning, interactions and the involvement of parents during therapy. Observations of treatment sessions and interviews with PTs were selected. Overall impressions from these were reviewed in more detail.
⇕ Coding		
Meaningful units were identified, coded and sorted into themes using Nvivo 10.	Meaningful units were identified by searching the video recorded material for relevant sequences. These were coded and sorted into themes using NVivo 10.	Meaningful units from interviews and videos (selected by searching for relevant sequences) were identified, coded and sorted into themes using NVivo 10.
⇕ Condensation		
Within each theme, a text with the essence of the parents' statements was composed. This formed the basis of the presentation of results in paper I.	Within each theme, a text with the essential understanding of situations was composed. This formed the basis of the presentation of results in paper II.	Within each theme, a text with the essence of the PTs' statements and our understanding of the situations was composed. This formed the basis of the presentation of results in paper III.
⇕ Synthesis A		
Connections to theory provided further insights in the discussion of findings.		
⇩ Synthesis B		
A collective view of the results and connections to theory developed further interpretations, and findings were discussed as presented in this thesis.		

4.5.1 Analysis of interviews

All of the interviews were transcribed verbatim by the PhD candidate. According to the preliminary developed topics, the data material from the interviews with the parents were included in paper I, while the data material from the interviews with the PTs were included in paper III. During step 1) total impression B, or the overall impression from the selected data material, was reviewed in more detail. In step 2) coding, meaningful units were identified in the interviews were and then coded and sorted into themes using Nvivo 10 (QSR International Pty Ltd, 2012). To establish codes, I strove to use terms that were closely related to the participants' statements instead of using pre-determined denotations that categorized or labeled them in accordance with theory. In step 3) condensation, a text was written that encompassed all of the meaningful units within each theme. This formed the basis of the presentation of results in papers I and III. Finally, in step 4) synthesis, connections to theory were developed in the analysis, and meanings relevant to the research question were evaluated.

4.5.2 Analysis of video recorded observations

Initially, I transcribed the observations at an overall level. This provided an overview of the material that described its content and situations of interest. Data obtained during the observations were considered relevant and thus included in the analyses performed for papers II and III. In phase 1) total impression B, the overall impressions of the selected data material were reviewed in more detail. In step 2) coding, the selection of meaningful units involved performing a review of the videos to identify relevant sequences for the topics of each paper. Using Nvivo 10 (QSR International Pty Ltd, 2012), these sequences were systematically coded and categorized into themes. During this process, I actively searched for similarities and deviations between events (Heath et al., 2010). The selected video sequences were repeatedly reviewed, and their main themes were further developed in cooperation with the thesis supervisors. In phase 3) condensation, a text describing an essential understanding of the included situations was written, and this formed the basis of the presentations described in the results of papers II and III. As part of this phase, the situations that were the most illustrative of our findings were transcribed in detail and then used later in the presentation of results in the papers. The goal was not to write down every detail but to transcribe the information considered to be relevant to the research questions presented in each of the papers. Finally, in phase 4) synthesis, connections to theory were used to further interpret and discuss the findings. While the analysis of observations adhered to Malterud's (2012) procedural steps, less of the content within these steps was reflected in writing. Instead, an extensive review of the videos provided an opportunity to explore the data, look repeatedly at the sequences of particular interest and then study details that might not have been noticed using observation alone (Heath et al., 2010). Collaborative discussions during these review processes helped to decide the final articulation, composition and interpretation of findings.

4.6 Methodological considerations

Over the years, qualitative research has been criticized for being subjective in its quest for knowledge and lacking in facts and therefore less reliable than quantitative research traditions (Malterud, 2001; Mays & Pope, 1995). However, these comparative and unfavorable claims are based on a positivistic knowledge view and do not do justice to the qualitative methods that are used to conduct research and build knowledge. In accordance with the hermeneutic methodological views, knowledge that is developed from qualitative studies is different in nature and provides insights that cannot be obtained using quantitative methods (Malterud, 2001; Mays & Pope, 1995). Acknowledging the researcher as a tool in the investigation and the study participants as active contributors in it allows qualitative knowledge building to become an interactive, interpretive and reflexive co-construction of meanings

that can be perceived as reliable in terms of their relevance and usefulness beyond the specifics of the situation.

Analogous to quantitative traditions, the qualitative research process must remain systematic and accountable. Nevertheless, such an evaluation of qualitative research needs to be based on its own premises (Malterud, 2001; Mays & Pope, 1995). By providing rich descriptions about the procedures and development of a study, including the influences of the researchers and participants as well as interactional and contextual factors, the process becomes transparent and can be subjected to evaluations of the knowledge that is produced by it as relevant, valid and reflexive (Malterud, 2001). The question of how to address such evaluations is also a matter of debate. Terminologies vary widely, and the use of standardized checklists might not do justice to the study as a whole. Thus, in an attempt to avoid the rigidity of checklists and the obscurity of abstract meta-criteria, I chose the EPICURE evaluation agenda (Stige, Malterud, & Midtgarden, 2009) for the presentation of methodological considerations during the study. Each letter represents an item that is up for evaluation, and the agenda is related to two dimensions: EPIC, which is about giving rich, substantive accounts of the research process, and CURE, which addresses the preconditions and consequences of the research (Stige et al., 2009).

4.6.1 Engagement

The topic of engagement relates to how the researchers in the study affected the study outcomes throughout the research process (Stige et al., 2009). As a researcher in the study field, I bring my PT background and work experience from pediatric physical therapy in the municipalities with me. Thus, I am familiar with both the field of study and the professional knowledge base that underpins its clinical practices. Moreover, it is on the basis of this familiarity with the study field that the project and research questions have emerged. As a clinician, questions regarding how and to what extent parents can be involved in the treatment of their child have emerged both from my own experiences in the clinic and from literature regarding different therapeutic approaches. I have questioned why PTs (myself included) who acknowledge the benefits of involving parents, still find it difficult to include them in the therapeutic work during clinical encounters. At the same time, descriptions of FCC approaches that tend to diminish the role and professional knowledge of the PT has made me wonder about the direction the profession is heading. I believe that we the need to develop therapeutic approaches that encompass both the specialized knowledge and skills of the PT and the transfer of these insights to the parents at a relevant level for them to use in everyday life. Undoubtedly, this is a pre-conception that has influenced the development and outcomes of this study.

Supervisor Gunn Kristin Øberg is also a pediatric PT who has hospital/ NICU work experience. Thus, she shares my proximity to the field of study of pediatric physical therapy. Such familiarity can be considered beneficial because the researcher's own experiences can inform the research process and allow valuable meaning to be unveiled (Borbasi, Jackson, & Wilkes, 2005; Malterud, 2016). Experience from the research field can also make the researcher more confident and comfortable in interactions with the participants. Nevertheless, with this familiarity comes the risk of ignoring implicit or taken for granted issues (Borbasi et al., 2005). Although we acknowledge that this might have occurred, we believe that the inductive attitude that was assumed during the preliminary phases of the analysis promoted our attentiveness toward the participants' own priorities and engagements. Furthermore, as a sociologist and a nurse, co-supervisor Aud Obstfelder is more remotely positioned to the field of study, and this enabled her investigations and enquires about pre-conceptions and

implicitness during the analysis. In summary, we believe that the close collaboration among the members of our research group, each of whom brought different experiential and knowledge perspectives toward the study field, promoted openness, flexibility and reflexivity in our interpretations of the study findings.

4.6.2 Processing

In a qualitative investigation, there are many points along the production, analysis and presentation of the data material that can influence the results (Stige et al., 2009). During the production of data in this study, the combination of observations and interviews provided us with a rich dataset that contained both the researchers' own comprehensions of situations and the participants' perceptions and explanations. Furthermore, the longitudinal design of the study provided us with rich, nuanced data and insights into each PT-infant-parent relationship and their collaborative work processes over time. Within this longitudinal approach, my preparations for second and third visits promoted my awareness of and adaptation to the characteristics of each situation.

The study sample and saturation of data influences the transferability of knowledge outcomes from qualitative studies (Creswell, 2007; Kvale & Brinkmann, 2009; Malterud, 2001). Our sample represent a variety with regard to both the children's condition and the PTs' background and experience. Thus, we perceive of our data as rich and saturated by means of providing sufficient and varied insights across different therapeutic approaches and across different experiences among the parents and PTs. Saturation of data was also perceived by the fact that many topics from the first and second visits repeated themselves during the third visits with each infant-parent-PT triad. However, there was also a tendency of new and more controversial information to be disclosed by the parents during these final visits. This might relate to the fact that they knew that this was their last chance to speak their mind. Nonetheless, it can also indicate that more information would have been revealed if more visits had been scheduled. Finally, looking at the data collection period overall, saturation was also revealed as we observed that the overall impressions from visits toward the end of the period aligned well with the preliminary topics of interests that had already evolved.

In regard to the video recorded observations, both the PTs and parents left us with the impression that the observed sessions were representative of their typical physical therapy encounters and that they quickly forgot about the researcher's presence. This connects with the view that participants' reactions to being observed should not be exaggerated (Heath et al., 2010). As we analyzed the material, the impression that the sessions proceeded with little disturbance due to the researcher's presence was confirmed. However, there were occasional comments from the PTs and parents toward the researcher, most often to fill the researcher in on subject matters discussed between the two. With regard to the occasional lack of parental involvement that some of the PTs attributed to the researcher's presence, this was accounted for during the analysis. We have not presented this as a negative trait or criticism of the PT's conduct during therapy, but we have instead emphasized the benefits of situations in which the parents are involved as active interaction partners with the infant and PT. Similarly, although the one situation in which the parents felt that the PT was more attentive than usual can be interpreted as distorting the representativeness of the data material, it can also be perceived as an enrichment of the data because it provides access to the PT's best performance with regard to parent involvement.

As for the interviews, the range and variety of content, viewpoints and experiences indicated that both the PTs and the parents were able to regulate the development of the conversations and focus on their

own topics of interest. My probing questions and confirmation of my understandings during interviews also contributed to the validation of the participants' statements and our interpretations of them (Kvale & Brinkmann, 2009). However, my background as a PT has likely impacted the participants' choices of topics and sharing of experiences during the interviews. For the PTs, there were many occasions in which they were eager to discuss details regarding their observations of the child and explain more technical sides of their professional knowledge. This level of detail would less likely be elaborated on to an interviewer who did not share their PT background. For the parents, there is a risk that their knowledge about my PT background made them hesitate in their sharing of critical remarks regarding physical therapy. In addition, the cautiousness of both PTs and parents with regards to criticizing each other implies that challenges and negative aspects in their collaboration might have been under-communicated.

As we started the study, we wanted to collect video-diaries from the parents which could provide us with insight into the parents' handling skills and transferal of activities from therapy sessions into their daily routines. The choice to discontinue the collection of these video-diaries has effected the study outcomes in that we do not have access to such observations. While we did receive valuable information regarding these topics from the interviews with the parents, video observations from their everyday life would have been a valuable addition to the data set.

In the analyses, an overall adherence to the systematic text condensation approach (Malterud, 2012) provided structure to the process. This choice of approach facilitated a theme-based interpretation of findings that concurred well with our study aim and research questions. Nvivo (QSR International Pty Ltd, 2012) was a valuable tool during the coding, sorting and building of the main themes as it provided an overview of the material and at the same time gave structure and flexibility during the analysis. However, the analytical procedures used to evaluate the video observation material were less obvious than those for the interviews. Because there were only limited accounts in the literature describing how to proceed (Heath, Luff, & Svensson, 2007; Wang & Lien, 2013), we had to improvise and develop our procedure as we proceeded with the analysis. We consider that our approach of extensive viewing and reviewing of the material was more effective at providing insight into patterns, meaningful units and themes than the alternative time-consuming process of assembling detailed, multi-dimensional written transcriptions of the material. In hindsight, however, a more detailed observation guide in preparation for the analysis would probably have provided more structure at an earlier point of this part of the analysis.

Finally, our presentation of the data in three papers adheres to the systematics of the analytical process, and separate result sections serve to allow the reader to come to their own impression of the material. Our interpretations are then presented and their adequacy can be evaluated by the reader. Nevertheless, presenting video observations in journal articles is challenging. The describing of situations using the necessary level of detail is made difficult by word count restrictions, and a written story line will inevitably be less informative than watching the videos themselves.

4.6.3 Interpretation

The creation of meaning as part of the analytical process is pivotal to the development of qualitative knowledge (Stige et al., 2009). The interpretive process used in this study is characterized by an initial inductive approach in which the overall impressions and meaningful units obtained from interviews and videos directed the development of codes and themes. While our interest in interactional aspects in physical therapy and our acquaintance with enactive theory influenced our work from the very

beginning, the theoretical framework was not a predestined choice. Rather, it emerged together with developing analysis, as we gradually realized that the use of concepts and notions within the enactive theoretical framework provided new insights and explanations to our findings. In accordance with Malterud's (2001) descriptions, our continuous cross-checking back with the data material by actively searching for similarities and contradictions between events and alternative understandings brought nuances to the analysis and provided reassurance of the validity of our findings and interpretations.

4.6.4 Critique

One important trait of the systematic research process is the ability to be critical of one's own work and to recognize its strengths and weaknesses (Stige et al., 2009). First, this implies that critical reflections of the researcher as an instrument in the process are needed. The collection of both observations and interviews was influenced by our stance and fields of interest as researchers (Malterud, 2001; Reid & Mgombelo, 2015). Thus, our attention toward parent involvement together with the characteristics and participant perceptions of therapeutic interactions has guided us in all decisions and interpretations throughout the collection and processing of data. In this regard, the early decision on the three preliminary topics was a pivotal one, by which other topics that could have been interesting to pursue were abandoned. In the analysis within each of these three topics, however, our inductive approach to the coding and building of themes facilitated the awareness and inclusion of the range of participant perspectives.

In regard to my role as interviewer, Borbasi et al. (2005) argue that nurses have a benefit as interviewers because interview skills are something they have been trained in through their everyday work with patients. For example, they know how to treat individuals as persons, how to ask questions and how to talk to people. This is an assertion that can also be applied to myself, because such skills are equally relevant to a PT's clinical practice. In addition, my PT background facilitated the participating PTs' elaborations of their professional experiences and opinions. However, there were also drawbacks to my entering the study field as a PT. The participating PTs were occasionally anxious about being tested on their skills, and as previously mentioned the parents were cautious about being critical. I was aware of these issues from the beginning, and the participants confirmed that I was able to gradually resolve these concerns as we developed rapport and trust in the researcher-participant relationship. Nonetheless, these issues might have hampered the participants' ability to freely share their opinions and experiences. As a consequence, our data set might reflect more positive than negative aspects of the participants' experiences.

Second, being critical involves awareness of the value of the work in the broader social critique setting is warranted (Stige et al., 2009). Our research can be perceived as an expansion of the traditional, neuroscientific perspectives and the way they are applied to clinical practice in pediatric physical therapy. By this, we respond with a petition for more inclusive, embodied theoretical approaches in physical therapy (Nicholls & Gibson, 2010). By the introduction and use of enactive theoretical perspectives in our comprehension of clinical practice we provide new knowledge in support of a global perspective of how infants' skills across motor, cognitive and social domains co-emerge and co-develop (Lobo et al., 2013), and underscore the PT's role as a facilitator of these processes in collaboration with parents. However, the enactive approach is a complex and evolving theoretical framework and our application of it in a clinical setting is open for future critique, revisions and improvements.

4.6.5 Usefulness

In an evaluation of the value of a research project, its usefulness in a practical setting needs to be considered (Stige et al., 2009). This usefulness is related to the pertinence of the research question, including the question of what were the prescientific conditions from which the focus of the study emerged in addition to the researcher's own pre-conceptions about the study field. The prescientific conditions of this study include the current physical therapy literature and the ongoing debate about FCC and its relationship to the range of available treatment approaches (e.g., hands-on versus hands-off). In addition, the recently implemented coordination reform with its increasing demand for well-integrated, high-quality healthcare services in the municipalities represent a prescientific condition that has influenced the field and focus of interest in this study. The connection to the NOPPI study and its focus on parent education and enablement also represents a pre-conception on behalf of the researchers. Our interest in parents' role in their infant's learning and developmental processes and the PTs' role in supporting both the parents' and the infant's ability to learn skills was a decisive factor during the development of this study. Adding to what is currently known about these interactive learning processes in clinical practice was a priority for us. Thus, this study is useful because it furthers the current debate about clinical practice with regard to the theoretical foundation of the physical therapy profession as well as the development of new and improved therapeutic approaches in pediatric physical therapy.

4.6.6 Relevance

The usefulness of a study is closely connected to its relevance, meaning the study context and how it contributes to the development of knowledge within the study field (Stige et al., 2009). Our study was conducted in Norway, which is a western society with readily available healthcare services and social security systems that enable parents to stay at home and care for their infant during the first year of life. Thus, our findings and associated interpretations should be viewed as evolving in an "ideal setting" with regard to availability and collaboration between the PTs and parents, in addition to the parents' opportunities to support their infant in everyday life. Inevitably, our findings should be viewed in light of the social context in which they exist, and collaborative work between PTs and families can and will be different depending on the social context they are a part of. Nonetheless, we contend that our study provides valuable insights into the requirements for and values of interactive, collaborative therapeutic processes, and that these insights can be applied and adapted to different cultural settings.

4.6.7 Ethics

Finally, evaluations of qualitative studies must include considerations of how ethical values and principles are integrated and maintained during the research process (Stige et al., 2009). In this study, ethical considerations were accounted for and approved by the NSD (the Norwegian Centre for Research Data, previously the Norwegian Social Science Data Services; see appendix 1) and performed in alignment with the Helsinki Declaration (World Medical Association, 2013). We ensured that the participants provided informed consent of their own will, and we maintained their anonymity and confidentiality throughout the study. All audio, video and written materials were stored electronically on a secure, password-protected server. All written material was depersonalized.

Although these main ethical concerns were well maintained, other ethical issues arose during the study. The main ethical concern was the researcher's potential disturbance of the PT-parent relationship. This issue was already apparent when I was obtaining consent from participants to be

included in the study. The parents first provided me with their informed consent and contact information for their municipality PT. Thus, when their PT declined to participate, I had to inform the parents of this decision. At times, there was some ethical tension to these situations in that I was not to disclose the PT's reasons for declining (if and when such reasons were provided to me by the PT), but I did not want to leave the parents with the perception that their PT did not want to cooperate. To solve this, I carefully clarified that their PT had declined and that I was not to disclose why he or she had come to this decision, and I finally stated that there could be many and good reasons to do so.

Cautiousness with regards to the PT-parent relationship was also important for those who did consent to participate. Because the informed consent allowed for both the PT and the parent(s) to share information about each other with me, it was important to ensure to them that all of this information would be kept confidential and handled with discretion and respect. A common trait for the PTs and parents was an occasional curiosity and probing regarding my conversations with the other participant. For example, a PT could ask 'I do not know if this aligns with what the parents have said?', or a parent could comment 'I do not know whether the PT might perceive me as a difficult parent?'. On such occasions, I gave a friendly reminder that each conversation was confidential, and I reassured them that they could trust both parties to be treated respectfully. This response appeared to be well accepted, and both PTs and parents confirmed that they felt reassured because it aligned with how the third person was spoken of during their own interviews.

Another ethical issue was the participants' request of my professional opinion and advice during the research visits. Although they generally understood and respected my role as a researcher, both the PTs and parents would occasionally ask if I had observed things that they were not aware of, or if I had suggestions on how to proceed with therapy. I was cautious about such sharing of opinion because I did not want to distort the PT-parent relationship or portray myself as knowing better than them based on a few observations. At the same time, it was important that the participants felt that their involvement in the project was worth their while and rewarding. Therefore, my responsiveness to such questions varied. As a general rule, I emphasized my observatory role and reassured them that my observations did not elicit any concerns regarding the child's services. On some occasions however, I would offer some practical suggestions and ideas on ways to work with the child in relation to specific goals and problems to be solved.

5 Results

5.1 Paper I

In this paper, we investigated parents' perceptions of the physical therapy service that they received and how the service could contribute to their adaption to life with a preterm child. The research questions were:

> How do parents perceive physiotherapy in primary health care, and how does said perception influence their adaptation to raising a preterm child?

This first paper drew on the 17 interviews that were conducted with the parents of 7 infants. The analysis included a systematic text condensation (Malterud, 2012). In the interpretation of our findings, we connected our data to enactive theoretical perspectives, with a particular focus on the concept of participatory sense-making.

The parents in this study eagerly engaged in discussing how they had learned and how they could still learn to cope with having a preterm child. This learning process represented a regaining of normalcy after the life-altering event of having a preterm child. In this process, their perception of the infant and acceptance of the situation were intertwined and represented the building blocks of a new life. However, uncertainty surrounding their child's future development could disrupt the parents' pursuit of normalcy. Physical therapy was as a potential guiding resource that helped these parents to accept this uncertainty and facilitated their progress toward normalcy. When this process failed, however, parents were frustrated and less able to recognize the benefits of physiotherapy. Thus, the parents' coping abilities relied on a therapeutic approach that was focused on learning about and interacting with their infant. Providing clear information facilitated the parents' comprehension of how to care for their infant. When the parents became involved in therapy, they were provided with opportunities to discover and develop the skills that were necessary to interact with their child. In summary, information and involvement in therapeutic activities enabled the parents to understand their infant's development and how to support their child and instilled the confidence necessary for them to do so.

These findings indicate that health care providers should be aware of and find ways to contribute to parents' adaptation and normalization processes. Nevertheless, problem-oriented physical therapy can appear irrelevant to the parents. Parents must acquire knowledge regarding their infant's development and reconstruct their visions of future probabilities and possibilities. By using bodily actions and interactions, PTs have a unique opportunity to support these processes. PTs who provide parents with the knowledge they need and acknowledge the child and the parent-child relationship can ameliorate uncertainty and support the parents as they progress toward normalization. They therefore facilitate a mutual exploration of the infant's capabilities and interactional skills and contribute to the parents' relationships with their infant so that they view him or her, not as a preterm infant with special needs

with whom they are familiar, but as an individual developing his or her selfhood via interactions with the world.

Key Messages

Parents must learn and feel confident about how to support their child.
Information and involvement in physical therapy facilitate parental learning and normalization processes.
PTs are in the unique position to teach parents to support their child through bodily interactions.
PTs can help create the parent-child relationship and the parents' perception of their child as a capable individual.

5.2 Paper II

In this study, we investigated the PTs' utilization of motivation, attention and play in the physical therapy encounters with the preterm infants and their parents. The research question was:

> In what ways do PTs scaffold and use preterm infants' sensory-motor play engagement in their work to achieve therapeutic goals?

This second paper drew on 20 observations of physical therapy sessions performed with 7 infants. The analysis aligned with the principles of a systematic text condensation (Malterud, 2012), and connections to enactive theory on cooperation became a means to expand the existing theory about therapeutic play.

We focused on the PTs' facilitation of motivation, attention and play, and the analysis of our observations demonstrated that there are three dimensions to a PT successfully achieving infant engagement and motor improvements. 1) The PT organized a therapeutic play arena with equipment and toys that enabled therapeutic activities to occur in accordance with the infant's developmental stage and interests. 2) By accommodating the infant's communication of motivation, interest and engagement, the PT adjusted the therapeutic strategy and allowed the infant to guide the course of action. These adjustments facilitated prolonged training sessions and provided the infant with novel motor challenges that promoted the emergence of new skills. 3) The PT identified the infant's motor problems and incorporated therapeutic measures as well as modified and introduced new motor challenges relevant to the motor goals into the play activities. Therapeutic handling was a key feature of incorporating therapeutic measures into play as it provided the PT with information about the infant's compliance and enabled the infant to discover and pursue new sensory-motor play possibilities.

These findings demonstrate that in physical therapy, interactive, sensory-motor play relies on mutuality between the PT and infant. With a heightened sensitivity to the infant, the PTs were able to use their interactive play engagements with the infant to explore therapeutic possibilities and improve the infant's motor performance. This was achieved in what we denoted as a new concept: *Enactive therapeutic sensory-motor play*. PTs need to be competent at recognizing and pursuing a child's signs of intention, attention and motivation. Simultaneously, PTs must plan and put a therapeutic strategy into action and find ways to merge these processes into engaged, interactive sensory-motor play. Therapeutic measures, the choice of toys and changes to the task or environment need to viewed as a

part of the game and not a disturbance to it. Furthermore, PTs need to address the child's specific motor impairments during play. Using this approach, PTs can establish a clinical play arena of cooperative and interactive learning in which the child can develop new skills across the motor, cognitive and social domains.

Key Messages

PTs can use an infant's motivation to play as a therapeutic tool.

PTs' use of sensory-motor play requires planning, perceptiveness and sensitivity in interactions.

The concept of enactive therapeutic sensory-motor play facilitates child engagement, cooperation and learning.

5.3 Paper III

In this study, we investigated the PTs' collaborative work and clinical reasoning (CR) processes during interactions with the infant and parent(s). The research question was:

How do interactional CR processes unfold and develop in physical therapy for preterm infants and their parents?

This third paper drew on 20 interviews with PTs and 20 observations of physical therapy sessions. The analyses adhered to a systematic text condensation (Malterud, 2012). In the analysis, we connected to enactive theory regarding interaction and the co-creation of meaning.

Within each PT-infant-parent(s) constellation, the PTs explored and reasoned about the appropriateness of physical therapy treatment. Their CR was achieved by employing adequate therapeutic measures, doing them the right way and catching just the right moment to do it. During this process, the PTs continuously evaluated infant and parent(s) characteristics and responses in addition to the therapeutic process and their own actions. Intrinsic to this CR was a recurring doubt about the adequacy of physiotherapy treatment. A key component of the PTs' CR was their perception of the underlying developmental drive for the infant, which enabled therapeutic collaborative work. CR was also about enabling the parents as facilitators of the infant's development. When the PTs succeeded with their education and the involvement of parents, the sharing of knowledge, ideas and experiences enriched the PTs' CR and uncovered new therapeutic possibilities. Nevertheless, the PTs' cautiousness about being critical and correcting the parents' handling techniques could hamper their collaborative work.

The findings reported in this paper illustrate that CR is reliant on the distinctiveness of the situation and the emerging interactions with the infant and parent(s). The PT develops interactional understanding, which supplements the professional knowledge base and contributes to the shaping of CR. As interactions unfold, the PTs evaluate the infant's development, parental needs, therapeutic content and their own performance, and they then make their decisions about how to proceed with therapy. However, this interactional CR is vulnerable. The infant's disengagement, parents' expectations and PTs' preoccupations can obfuscate interaction and hamper CR. In summary, PTs' CR processes are not individual endeavors. PTs need to attend to the infant and parent(s) and develop flexibility and fluency in their therapeutic interactions. It is through this mutual, embodied, social engagement that the PTs can develop an integrative CR that can be translated into meaningful actions

for all three participants. This reliance on bodily experiences and interactions instills the PTs with confidence regarding their professional role and how they can contribute to the development and learning of both the child and his or her parents. We suggest that the benefits of triadic embodied-enactive CR should be integrated and utilized across therapeutic approaches, to expand and enrich PTs' repertoire of collaborative learning.

Key Messages

PTs' CR concerning the underlying developmental drive in the child enables their therapeutic collaborative work.

Educating and involving parents enriches CR and reveals new therapeutic possibilities.

The child's disengagement, parental expectations and PTs' preoccupations can obfuscate interactions and hamper CR.

Triadic embodied-enactive CR enriches the PTs' repertoire and should be integrated and used across all therapeutic approaches.

5.4 A collective view of the results

At this point, let us revisit the overall research question: What are the interactional keys to success in PTs' family-centered work with preterm infants and their parents? In answering this question, the key messages from the three papers point us in the correct direction:

Parents must learn and feel confident about how to support their child.

Information and involvement in physical therapy facilitate parental learning and normalization processes.

PTs are in the unique position to teach parents to support their child through bodily interactions.

PTs can help create the parent-child relationship and the parents' perception of their child as a capable individual.

PTs can use an infant's motivation to play as a therapeutic tool.

PTs' use of sensory-motor play requires planning, perceptiveness and sensitivity in interactions.

The concept of enactive therapeutic sensory-motor play facilitates child engagement, cooperation and learning.

PTs' CR concerning the underlying developmental drive in the child enables their therapeutic collaborative work.

Educating and involving parents enriches CR and reveals new therapeutic possibilities.

The child's disengagement, parental expectations and PTs' preoccupations can obfuscate interactions and hamper CR.

Triadic embodied-enactive CR enriches the PTs' repertoire and should be integrated and used across all therapeutic approaches.

At the first glance, however, many of these key messages might be perceived as familiar and well established knowledge. For example, the FCC tradition already supports the importance of involving and educating parents, and infants' interactive play, attention and engagement are well known prerequisites to learning. Nonetheless, by using an enactive theoretical perspective with participatory sense-making and co-creation of meaning at its core, these well-known therapeutic principles are expanded and provided with new content.

Hence, the three papers included in this study serve to advance important aspects of PTs' FCC approach for preterm infants and their parents in the municipalities. Papers I and II discuss these aspects from the parents' and infants' perspectives and the implications of these findings for PTs' clinical practice. In summary, the included papers demonstrate that physical therapy needs to be an arena of engagement and interactive learning, for both the child and the parents. Moreover, there is an interdependence between parent and infant learning. When parents learn how to support and promote their infant's development in everyday life, the infant will likely get more opportunities for play-situated rehearsal and repetition of new motor skills. Conversely, when a PT succeeds with the facilitation of an infant's motivated learning and the emergence of new skills, the parents learn about their infant as a capable individual who develops during engaging and supportive play interactions in everyday life. These perspectives come together in the paper III, in which therapeutic interactions are discussed with regard for the PTs' CR processes in the FCC setting. Paper III demonstrates the frailty and risk of distortion of this interactional, ongoing CR, which results from misconceptions and pre-occupations among the interactional partners. On the other hand, it also points out the benefits of successful interactions to both the infants' and the parents' learning as well as to the PTs' CR and professional confidence.

6 Discussion

In the discussion, I will start by connecting and combining the key messages from the three papers, and I will then demonstrate and discuss the ways in which they represent keys to success in family-centered physical therapy for preterm infants and their parents.

6.1 Therapeutic keys to preterm infants' motor learning

Our findings demonstrate how PTs connect and coordinate themselves with the preterm infant's play engagements and scaffolding needs and how PTs evaluate an individual child's developmental drives. This interactional knowledge about the child becomes foundational to their CR process, which allows them to tailor interventions and engage this particular child in activities that facilitate learning and development.

Relevant key messages

PTs' CR concerning the underlying developmental drive in the child enables their therapeutic collaborative work.

PTs can use an infant's motivation to play as a therapeutic tool.

PTs' use of sensory-motor play requires planning, perceptiveness and sensitivity in interactions.

The concept of enactive therapeutic sensory-motor play facilitates child engagement, cooperation and learning.

As we have seen, preterm infants are at risk of neurodevelopmental impairments. Motor problems, attentional deficits and behavioral challenges all influence the preterm infant's learning abilities (Allen, 2008; Anderson, 2014). Thus, the PTs' tailoring of interventions is a matter of moving beyond these challenges to find and access the keys to learning for the infant. When we look at infants' motor learning from an action-perception perspective, it is described as a growing ability to predict and make accurate judgements about movement solutions in variable environments (Adolph, 2005; Bertenthal, 2008). Enactive theory rejects the idea of cognitive prediction and the judgment of events that are yet to occur as a foundation for infants' sensory-motor problem solving. While such representations may well exist in more mature motor behaviors and decision making, the infant's motor learning is fundamentally embodied in nature. As the infant explores and problem-solves the movement possibilities of the body in variable surroundings, (s)he achieves knowledge of being and acting as an embodied agent in the world (Gallagher, 2005; Zahavi, 2004). Knowing what one's body can and cannot accomplish does not require a higher-order cognitive judgment of the situation. The infant's learning in terms of sense-of-ownership (i.e., this is my body) and sense-of-agency (i.e., this is what I can do with it) shapes the infant's embodied knowledge about his or her selfhood and what (s)he is capable of. Thus, as the experienced infant encounters new challenges, his or her body already knows whether the current task is one to go ahead with or one to avoid. For the very same reason, the inexperienced infant is willing to fail at tasks that are too difficult because (s)he knows that the only way to determine what one is capable of is by being, acting and figuring it out as an embodied agent in the world. Hence, the infant's exploratory movement activity is simultaneously a driving force behind the infant's building of the self during playful interactions with others and surroundings. Relating this to physical therapy, PTs need to acknowledge and support these developmental processes for the preterm infant. Thus, a therapeutic key is to provide the preterm infant with novel, ground-breaking motor experiences during the process of learning about him/ herself as a capable individual. Through these experiences, the PT can support the preterm infant's embodied cognition about his or her possibilities and agency in interactions with the surroundings.

This leads us to a second therapeutic key to successful learning: PTs must provide the preterm infant with sensory-motor play activities that (s)he really wants to accomplish. It is via the infant's attention and motivation for action that the neural system is aroused and learning can occur (Brodal, 2010). To some extent, this might be self-maintained by the infant's innate drive to perform movement exploration for its own sake (Adolph & Robinson, 2015). Nevertheless, we believe that there is more to this story. As our examples with Hannah and John demonstrate in paper II, in addition to the experiments performed in favor of the learning-to-learn paradigm (Adolph, 2005; Karasik, Tamis-LeMonda, Adolph, & Dimitropoulou, 2008), sensory-motor play explorations are by no means the infant's individual endeavor. Rather, motivation and exploration toward motor achievements are driven forward during interactions with the parent and PT. Conversely, as described in the examples with Anna and Vanessa in paper II, a child's motivation might be shattered by a PT's intrusive behavior. This brings our attention to the enactive perspectives of how infants' actions and development are always in interaction and cooperation with people and surroundings (Fantasia et al., 2014). In a therapeutic setting, PTs and parents are important facilitators of preterm infants' attention, motivation and motor achievements. Thus, the PT and parents need to work together to scaffold and engage the preterm infant in motivating, playful sensory-motor explorations of self and the environment. In relation to neurological and movement science theories, such explorations, when performed in cooperation with the parent(s) and PT, can provide the infant with motivating, variable, extensive movement experiences that support motor learning (Adolph, 2008; Dusing & Harbourne, 2010; Hadders-Algra, 2000b).

More specifically, motor learning is described as a process of movement trials and errors that occur across a range of postural milestones. Through these experiences, the infant discovers and selects the most appropriate movement strategies and continues to refine these into functional, flexible and adaptive problem-solving skills (Adolph, 2008; Hadders-Algra, 2000b). At this point, let us evaluate the notion of trial and error. In our comprehension of infant learning as a process involving the selecting and reinforcing of neural pathways that support functional, adaptive movements and skills, trial and error is certainly important. Nevertheless, if we revisit the work of Adolph and colleagues (2005), then we contend that errors primarily teach infants what *not to* do so that they can avoid making the same mistakes in the future. This is why the experienced infants make fewer errors of judgement of a task; they have learned to avoid those that are too challenging and to proceed with those that can be accomplished successfully (Adolph, 2005). Thus, crucial to the development of adaptive, functional motor skills are the infant's successful achievements (Dusing & Harbourne, 2010), based on a trial-and-error learning process involving extensive movement rehearsal, during which failed strategies are discarded while successful strategies are selected and refined.

A key premise for this discovery of successful movement strategies is the rich dynamics of the infant's developing system during interactions with the environment. By choosing from a large range of primary variability possibilities, the infant can problem-solve and succeed with new movement solutions under ever changing conditions. Nevertheless, this theory is related to how this works in healthy infants. In infants with neural lesions or those at risk of non-optimal neural development, such as the preterm infants in this study, the story is different. Some of these infants are likely to experience limitations in their primary variability repertoire (Hadders-Algra, 2000b). Moreover, although therapeutic measures at this young age should be aimed at expanding this repertoire, the possibilities for such expansions are likely to be limited (Hadders-Algra, 2010). Thus, extensive, variable experiences involving movement trials and errors might not lead to success. When these infants make

a mistake, they cannot easily discard the selected strategy and move on to another solution. They therefore risk running out of good options (Dirks et al., 2011). One solution to this is to allow the preterm infant to choose solutions other than the most typical (Dirks et al., 2011). Within the spectrum of atypical movement solutions, however, a risk exists that the preterm infant will find solutions that are dysfunctional (e.g., as when John in paper II is unable to lift his head in prone because of his many postural misalignments). Consequently, if the infant continues to move down such maladaptive tracks, these movements will be the ones that are consolidated in the neural circuitries. Moreover, if the preterm infant continues to fail as a result of the use of dysfunctional movement strategies, (s)he is likely to eventually stop trying. The infant will then have learned to avoid the activity. Thus, a therapeutic key is to enable the preterm infant to find successful solutions during the problem-solving of motor tasks. In paper II, John is given this opportunity together with his PT and Mom. Using her hands, the PT facilitates John to maintain a stable and upright head position, and he is subsequently able to engage in the keyboard play interaction with his Mom and PT.

According to the literature, the adequacy of such therapeutic handling is a matter of debate. In accordance with the NGST, it has been argued that therapeutic handling can disturb a child's initiation, exploration, selection and refinement of movement strategies (Blauw-Hospers et al., 2011; Dirks et al., 2011). Similarly, from the enactive theoretical perspective, hands-on techniques that passively induce movements or postural changes might impede a child's sense of agency because the child is no longer in charge of the movements (Gallagher, 2005). Nevertheless, if we look at any infant's first year of life, it is in the context of being picked up, supportively seated on someone's lap or given a gentle push to achieve new motor goals that infants learn and develop their movement skills. In addition, it is within such interactive events that infants prepare for and respond to perturbations to their body as part of the learning to move and moving to learn process (Adolph, 2008). In support of this view, studies have indicated that infants learn from the very beginning to orient their bodies during handling. They make preparatory postural adjustments upon being picked up by their parents, and they continue to develop and adapt these responses as they grow older (Fantasia, Markova, Fasulo, Costall, & Reddy, 2015; Reddy, Markova, & Wallot, 2013). With regard for the preterm infant, their problems with adaptation and the fine-tuning of postural control mechanisms (Dusing et al., 2016; Fallang, 2004) indicate that they might need therapeutic handling to facilitate the discovery and selection of available adaptation and movement strategies (Dusing & Harbourne, 2010). On this note, recent studies conducted in Norway indicate that interventions that include hands-on techniques to facilitate the child's active performance can improve motor development for the child (Ustad et al., 2016; Øberg et al., 2014). Moreover, presupposing that the infant is still the initiator of actions, the enactive view supports the idea that the infant should be able to recognize therapeutic handling as something that is induced from the environment (Gallagher, 2005; Zahavi, 2004) and integrate such handling into their self-initiated, active motor exploration and learning. In this way, the PT's handling can become part of a well synchronized mutual incorporation (Fuchs & De Jaegher, 2009) through which the preterm infant can engage in an interactional "perceiving and being perceived, acting and being acted upon" (Fuchs & De Jaegher, 2009, p. 477) process of movement learning.

Therefore, to move forward in the search for improvements in physical therapy for the preterm infant, we need to step away from the hands-on versus hands-off question. Instead, we should look at how the intervening hands of the PT can support the preterm infant's self-initiated exploration, selection and refinement of movement strategies. Returning to the example of John in paper II, the PT was able to facilitate his active neck extension, and chin tuck and subsequently unconstrained movements of his head and gaze. In accordance with the NGST (Hadders-Algra, 2000b), if the PT's handling techniques can induce such functional muscular activations for the child, this activation will inevitably be part of the neural firing patterns and thus a potential contributor to the preterm infant's variation, selection and refinement of movement strategies. This stands in contrast to more passive handling techniques, which can decrease the motor demands of the task, depress neural firing processes and reduce motor learning for the child (Lotze, Braun, Birbaumer, Anders, & Cohen, 2003). Thus, hands-on neural activation and explorations of movement patterns can be beneficial to the preterm infant's motor learning, while handling that hampers the infant's active, exploratory movement behaviors can be counter effective to learning. In conclusion, the preterm infant's active engagement, exploratory behavior and successful achievements, all of which are embedded in enactive therapeutic sensory-motor play, are fundamental and ultimate requirements of physical therapy. Through these activities, the infant can be engaged in stimulating therapeutic play activities that are likely to be extensively rehearsed and repeated in their everyday life with their parents as a means of learning new motor skills.

Interactional keys to successful motor learning

PTs must provide the infant with novel, groundbreaking motor experiences.

PTs must provide the infant with motivating sensory-motor play activities.

PTs must help the infant to find successful solutions to motor tasks.

The PT must use hands-on techniques to promote the infant's active, self-initiated movements.

6.2 Therapeutic keys to support and enablement of parents

Relevant key messages

Parents must learn and feel confident about how to support their child.

PTs are in the unique position to teach parents to support their child through bodily interactions.

PTs can help create the parent-child relationship and the parents' perception of their child as a capable individual.

Information and involvement in physical therapy facilitate parental learning and normalization processes.

Educating and involving parents enriches CR and reveals new therapeutic possibilities.

The PTs' work, which is aimed at promoting the preterm infant's learning and development, occurs in a family setting in close collaboration with the parents. Our findings show that the PTs' professional knowledge can support the parents' normalization processes by enabling the parents to perceive their preterm infant as capable and to make them feel confident about how to support their preterm infant's development. In return, by involving parents and incorporating their feedback in the CR process, the PTs discover new insights and possibilities in their work with the preterm infant.

Our findings align with the principles of FCC, in which the PTs collaborate with the parents and provide them with information, education and support (Campbell et al., 2012; S. King et al., 2004). Although the FCC approach indicates a redirecting of the PT's approach toward the role of coach for parents and observer of parent-child interactions (Blauw-Hospers et al., 2011), our findings indicate how PT-parent-child interactions in which all three are active participants lead to successful therapeutic achievements. In relation to enactive perspectives about infant learning, parents need to learn about and trust their pivotal, interactive role in their infant's cooperative learning and development. During their progress toward normalization, the parents make sense of their situation as they gradually learn and begin to feel competent in their care and support of their infant's development. Like the parents of any infant, they want to be able to recognize the preterm infant's movement capacities, provide handling to assist the infant when needed, and remove said handling in a timely manner. As I have argued, preterm infants are likely to need even more support, handling and encouragement that is specifically adapted to their motor challenges during their active exploration of self-initiated, attentional-driven motor learning. Therefore, PTs' teaching of these sensitive, adaptive facilitating skills to parents is a therapeutic key to success. This entails that the PT and the parent(s) need to work together in a mutual exploration of where when and how to use their hands and make adjustments to activities and their environment so that they can promote the preterm infant's own drive for action. In this work, an observer role leaves the PT (or parent) outside of bodily interactions with the infant, and (s)he therefore misses out on bodily perceptions of hands-on possibilities for movement activation and the infant's responses to handling. Active participation thus supersedes passive observations, because it allows for the interaction itself to inform and engage the participants in mutual incorporation with each other (Fuchs & De Jaegher, 2009). Nevertheless, this active role should by no means be equated with or lead to child-focused practices or involve unidirectional communication with parents (Blauw-Hospers et al., 2011). Instead, the PTs active role and embodied engagement, including hands-on techniques, needs to remain collaborative and coaching-oriented.

For this reason, the parents' active involvement cannot be left in parentheses. From the enactive perspective, their involvement and active engagement during therapy is equally important because it supports their sense of normalcy by allowing them to learn how to support their preterm infant. On this path toward a new normalcy, their interactional experiences form the basis of a transformational learning process (Di Paolo et al., 2010) for the parents. In paper I, the parents underscore this point in that factual knowledge about the child is valuable, but not sufficient. It is when this factual knowledge, which is loaded with uncertainty, comes together with interactional experiences that their transformation toward a new normalcy can occur. Through their experiences of involvement during therapy, the parents get to see what their preterm infant is capable of, and they can therefore develop their own interactional, supportive skills (see paper III appendix situation B). Building on the infant's motivated play engagements and movement capacities, the PT and parent(s) cooperate with the infant to discover ways to drive development forward. Thus, a therapeutic key to success is to help parents discover the infant's capabilities and the possibilities that reside in their parent-child interactions. Using this cooperative approach, PTs can provide parents with positive experiences that will support the parent-child relationship and help parents to incorporate their skills to support the preterm infant's special needs in their new normal, everyday life.

Our findings demonstrate how the active engagement of parents is also a transformative experience for the PT. By welcoming the parents as partners and contributors in the therapeutic process rather than mere facilitators of their own work process, PTs learn how to connect with the infant and discover new therapeutic possibilities. This demonstrates how the process of successful participatory sense-making can provide new insights to the participants as they willfully take into account the other's matters of significance (Fuchs & De Jaegher, 2009). Thus, as a third therapeutic key to support and enablement of parents, PTs must welcome and use the parents' interactional knowledge about the infant during the therapeutic process. By attuning themselves to the significances of the parents' knowledge about their preterm infant and the parent-child interactions, the therapeutic process can become a mutual exchange and transformation of experiences for how to coordinate and cooperate with the child.

Interactional keys to support and enable parents

PTs must teach parents sensitive and adaptive handling skills that enable the preterm infant's active exploration of self-initiated, attentional driven motor learning.

PTs must help parents discover their child's capabilities and the possibilities of parent-child interactions.

PTs must welcome and use the parents' interactional knowledge about the preterm infant in the therapeutic process.

6.3 Therapeutic keys to the collaborative work process

Knowledge regarding how interactions influence both the infant and their parents' perceptions and the learning outcomes of physical therapy indicates the complexity of requirements that PTs need to fulfill during therapeutic encounters. For the PT, these interactional processes and requirements are both challenging and rewarding at the same time. While the PTs strive to connect, coordinate and cooperate with both the infant and parent(s), the award when they succeed is an extension of their therapeutic repertoire and an ease of the individualized CR process.

Relevant key messages

Triadic embodied-enactive CR enriches the PTs' repertoire and should be integrated and used across all therapeutic approaches.

The child's disengagement, parental expectations and PTs' preoccupations can obfuscate interactions and hamper CR.

Let us take a closer look at the complexity of therapeutic interactions in pediatric physical therapy. Connecting to the concept of embodied-enactive CR (Øberg et al., 2015), the PTs' joint attention and communication must relate to both the infant and parent(s) and with the accordingly multiple interactional constellations and fields of attention to which the PTs need to orient themselves. As the encounters proceed, the interactions will fluctuate between "all together" constellations, in which both the infant and parent(s) are actively engaged, and varieties of "interactors + outsider(s)" assemblages, in which some of the participants are actively engaged, while others have an outsider(s), third-party position (e.g., parent-child interactions with the PT as outsider or PT-infant interactions with the parent as outsider). During these interactions, the PT must reason not only about the infant's movement goals and achievements but also about feasible ways to educate and support the parents' work with their infant in everyday life.

According to FCC recommendations, the priority should be on parent(s)-child interactions. The PT's role is to observe these interactions and coach the parent(s) by asking probing questions and make suggestions that enable the parents to explore ways to support the child (Dirks et al., 2011). While this approach is certainly beneficial to parent enablement, let us explore the consequence of this observatory role for the PT. By observing parent-child interactions, the PT can observe what motivates the infant in addition to the parents' ability and creativity regarding promoting this attentional drive. As previously discussed, this is valuable knowledge upon which the PT can build and develop a collaborative decision making process for how to support the infant's development. Moreover, the observer role provides the PT with insights into the parents' handling techniques, upon which they can suggest alternatives and give correcting advice when needed. However, there are also drawbacks to this approach. As an outsider of the bodily interactions between the infant and parent(s), the PT misses out on bodily perceptions of how to promote the infant's active exploration of new and more functional movement strategies. Consequently, it can be difficult for the PT to tell whether the parent's handling is in fact promoting the infant's active movement explorations or falls into the category of more passive handling that might impede the infant's learning. Thus, an observatory stance might hamper the PT's CR as well as their ability to teach parents adequate handling techniques to support the infant's learning and development.

Again, the magnitude of triadic PT-infant interactions is confirmed. It provides the PT with detailed knowledge regarding how to drive the infant's engagement, how to manage the infant's movement capacities and constraints, and how to enable the parents' competence and confidence in supporting

the infant's development. However, it is difficult to have all these processes occurring at once. Turning to our example of John in paper II, although Mom is an active participant in the keyboard play interaction, she remains an outsider to the PT's work at improving John's motor performance. On the positive side, Mom gets to experience how John's motivation and attention toward interactive play extends his motor endurance. She also gets to see how the PT's handling promotes John's active neck extension and chin tuck abilities, by which their interaction is simultaneously enhanced. On the negative side, Mom is not provided with the opportunity to try out the handling techniques for herself. Consequently, there is a risk that John will not get the extensive everyday opportunities that he needs to consolidate his emerging skills of functional weight bearing and head stability in prone. However, the PT would most likely not be able to teach Mom these skills without allowing her to try them out for herself first. She needs to explore and engage in the bodily interaction with John, to figure out how his available motor repertoires can be facilitated during his play engagement with the keyboard. Thus, she prioritizes the dyadic PT-infant interaction, and leaves Mom and John in charge of the dyadic play interaction.

Although triadic PT-infant-parent(s) interactions provide a richness of experiences for all three participants, these therapeutic encounters are loaded with interactional events that are predominantly dyadic. As already mentioned, a priority of dyadic interactions can be purposeful for both the PT's probing of therapeutic measures and the parents' rehearsal and accomplishment of therapeutic tasks. In addition, there might also be times when the PT and parent(s) together take an observational stance to the infant's solitary play, through which they learn about the infant's self-driven motivations for motor actions and problem-solving. Thus, the therapeutic encounters include a multitude of interactional constellations in which the infant, parent(s) and PT can all be active participants. Nevertheless, they might all at times need to take the role of a third-party outsider to an interaction. For the PT, attending and responding to these complexities of dyadic and triadic interactions is a formidable task. As the clinical encounter unfolds, the PT needs to monitor the interactional 'who is in and who is out' fluctuations and consider how these serve the therapeutic goal in the given situation. The skillful PT adapts the therapeutic process to these dynamics and allows for the fluency of the interactions to unfold (Fuchs & De Jaegher, 2009). This resonates with the enactive view of how the co-creation of significance and significant actions occurs "at the interplay between individual and interactional autonomy and vulnerabilities" (De Jaegher et al., 2016, p. 6). In clinical encounters, the child's playful developmental learning, the parents' competence and confidence in supporting their child, and the PT's CR towards these goals are all necessary ingredients of the co-creation of meaning. Moreover, it is at the interplay between these intentions and goals that the content of therapy can be perceived as significant for them all. Therefore, the PT's embodied-enactive CR during the clinical encounter requires a sensitivity and flexibility toward the interactional dyads and triads and an awareness and ability to reason about their contribution to the mutual, experiential knowledge building and learning. Building on the professional knowledge base, the quest of the PT is to create an interactive, therapeutic approach that encompasses both the infant and the parents' engagement, experiences and learning needs. Hence, a mutual co-creation of

Interactional keys to the collaborative work process

PTs must be sensitive and flexible toward interactional dyads and triads during therapy, and they must recognize their contribution to mutual, experiential knowledge building and learning.

PTs must use their professional knowledge to promote both the infant's and the parents' interactive discoveries and experiences during the therapeutic process.

meaning can evolve and facilitate cooperation toward the common goal of turning the infant's explorative, attentive and motivating sensory-motor play into successful learning and development.

6.4 Future directions

In this study, we investigated the interactional aspects of pediatric physical therapy. We connected this to enactive theory to extend the current knowledge of PTs' family-centered, collaborative work with preterm infants and their parents. We believe that enactive views on development, learning and interactions provide a framework that serves to highlight the characteristics of pediatric physical therapy and support theoretical and clinical advancements.

Thus, the exploration of enactive theory needs to continue because of its potential consequences in the field of physical therapy. For one, the concept of *enactive therapeutic sensory-motor play* needs to be further developed with regards for its content and variations across children's ages, types of play and therapeutic approaches. Moreover, the use of technology and toys (Bergen, Hutchinson, Nolan, & Weber, 2009; Cioni et al., 2016) during the enhancement of enactive therapeutic sensory-motor play is a promising field of investigation for the future.

Second, while our findings indicate the magnitude of the task of educating parents on how to support their child, we have not revealed a favorable extent of such teaching and learning. A pertinent question is whether limits can be drawn with regard for the parents' responsibility and the work aimed at supporting the child's development and learning (e.g., what and how much do the parents want to learn, and which parts of their therapeutic knowledge and skills can the PTs successfully teach to parents?).

Moving beyond the specifics of clinical encounters, our findings suggest that the PTs who are most confident in their professional role and who acknowledge their interactional, embodied knowledge base are able to provide more positive contributions to the lives of these families. This is a topic that can be investigated further in light of enactive perspectives regarding the co-creation of meaning in relation to roles and identities in a socio-cultural setting (De Jaegher et al., 2016).

Finally, this study indicates that pediatric PTs need to be skilled interactors during their collaborations with children and their parents. The question of how physical therapy students can best develop such interactional skills warrants evaluation and research to determine how different teaching strategies and educational programs enable PT students to develop their interaction abilities.

7 Conclusion

In this study we have investigated family-centered physical therapy for preterm infants and their parents in Norwegian municipalities. By integrating principles of FCC, knowledge of neuroscience and enactive theoretical perspectives, we sought to identify keys to successful, high-quality collaborative physical therapy services for these families. We have revealed, described and argued for a collaborative approach in which the PT uses his/her professional knowledge and competence in a mutual, active engagement with the infant and parent(s). To promote the preterm infant's learning, PTs must join in on the infant's own explorative sensory-motor play and simultaneously uncover and explore ways to improve the infant's motor performance. These include hands-on techniques, the use of toys and alterations to the task and environment. In their support and enablement of parents, PTs must develop their comprehension and ability to respond to the parents' needs and find ways to educate parents via involvement in the therapeutic work and interactions with the infant. Information exchange needs to move beyond the factual to include the exchange of embodied, experiential knowledge about the infant. These interactions during therapy include fluctuations and changes in priorities between different dyadic and triadic interactional constellations, which all need to be included in the PTs' CR-in-interaction. By this, PTs can contribute to a new everyday life for preterm infants and their parents in which they can work together in their experiences to learn new interactive movement possibilities and skills. This identification and description of the magnitude of mutuality and interaction during therapy serves to expand the knowledge base of the physical therapy profession and builds a foundation for the development of new and improved treatment strategies for the future.

References

Aagaard, H., & Hall, E. O. C. (2008). Mothers' experiences of having a preterm infant in the Neonatal Care Unit: A meta-synthesis. *Journal of Pediatric Nursing, 23*(3), e26-e36. doi:http://dx.doi.org/10.1016/j.pedn.2007.02.003

Adams-Chapman, I. (2006). Neurodevelopmental outcome of the late preterm infant. *Clin Perinatol, 33*(4), 947-964. doi:10.1016/j.clp.2006.09.004

Adolph, K. E. (2005). Learning to learn in the development of action. In J. Lockman, J. Reiser, & C. A. Nelson (Eds.), *Action as an organizer of perception and cognition during learning and development: Minnesota Symposium on Child Development* (Vol. 33, pp. 91-122). Hillsdale, NJ: Erlbaum.

Adolph, K. E. (2008). Learning to Move. *Current Directions in Psychological Science, 17*(3), 213-218. doi:10.1111/j.1467-8721.2008.00577.x

Adolph, K. E., & Robinson, S. R. (2015). Motor development. In R. M. Lerner, L. Liben, & U. Muller (Eds.), *Handbook of child psychology and developmental science* (7th ed., Vol. 2: Cognitive processes, pp. 114-157). New York: Wiley.

Adolph, K. E., Robinson, S. R., Young, J. W., & Gill-Alvarez, F. (2008). What is the shape of developmental change? *Psychological Review, 115*. doi:10.1037/0033-295x.115.3.527

Allen, M. C. (2008). Neurodevelopmental outcomes of preterm infants. *Current Opinion in Neurology, 21*(2), 123-128. doi:10.1097/WCO.0b013e3282f88bb4

Ambalavanan, N., Carlo, W. A., Tyson, J. E., Langer, J. C., Walsh, M. C., Parikh, N. A., . . . Higgins, R. D. (2012). Outcome trajectories in extremely preterm infants. *Pediatrics, 130*(1), e115-125. doi:10.1542/peds.2011-3693

Anderson, P. J. (2014). Neuropsychological outcomes of children born very preterm. *Semin Fetal Neonatal Med, 19*(2), 90-96. doi:10.1016/j.siny.2013.11.012

Arndt, S. W., Chandler, L. S., Sweeney, J. K., Sharkey, M. A., & McElroy, J. J. (2008). Effects of a Neurodevelopmental Treatment-Based Trunk Protocol for Infants with Posture and Movement Dysfunction. *Pediatric Physical Therapy, 20*(1), 11-22.

Arpino, C., Compagnone, E., Montanaro, M. L., Cacciatore, D., De Luca, A., Cerulli, A., . . . Curatolo, P. (2010). Preterm birth and neurodevelopmental outcome: a review. *Child's Nervous System, 26*(9), 1139-1149. doi:10.1007/s00381-010-1125-y

Atun-Einy, O., Berger, S. E., & Scher, A. (2013). Assessing motivation to move and its relationship to motor development in infancy. *Infant Behavior and Development, 36*(3), 457-469. doi:10.1016/j.infbeh.2013.03.006

Bartlett, D. J., Nijhuis-van der Sanden, M. W., Fallang, B., Fanning, J. K., & Doralp, S. (2011). Perceptions of vulnerability and variations in childrearing practices of parents of infants born preterm. *Pediatric Physical Therapy, 23*(3), 280-288. doi:10.1097/PEP.0b013e318227cc6b

Benzies, K. M., Magill-Evans, J. E., Hayden, K., & Ballantyne, M. (2013). Key components of early intervention programs for preterm infants and their parents: a systematic review and meta-analysis. *BMC Pregnancy and Childbirth, 13*(Suppl 1), S10. doi:10.1186/1471-2393-13-S1-S10

Bergen, D., Hutchinson, K., Nolan, J. T., & Weber, D. (2009). Effects of Infant-Parent Play With a Technology-Enhanced Toy: Affordance-Related Actions and Communicative Interactions. *Journal of Research in Childhood Education, 24*(1), 1-17. doi:10.1080/02568540903439342

Bertenthal, B. I. (2008). Perception and Action *Encyclopedia of Infant and Early Childhood Development* (pp. 510-522): ScienceDirect (Elsevier B.V.)

Bigelow, A. E., MacLean, K., & Proctor, J. (2004). The role of joint attention in the development of infants' play with objects. *Developmental science, 7*(5), 518-526. doi:10.1111/j.1467-7687.2004.00375.x

Blaikie, N. (2007). *Approaches to social enquiry: advancing knowledge* (2nd ed.). Cambridge: Polity.

Blanchard, Y., & Øberg, G. K. (2015). Physical therapy with newborns and infants: applying concepts of phenomenology and synactive theory to guide interventions. *Physiotherapy Theory and Practice, 31*(6), 377-381. doi:doi:10.3109/09593985.2015.1010243

Blauw-Hospers, C. H., De Graaf-Peters, V. B., Dirks, T., Bos, A. F., & Hadders-Algra, M. (2007). Does early intervention in infants at high risk for a developmental motor disorder improve motor and cognitive development? *Neuroscience and Biobehavioral Reviews, 31*(8), 1201-1212. doi:10.1016/j.neubiorev.2007.04.010

Blauw-Hospers, C. H., Dirks, T., Hulshof, L. J., Bos, A. F., & Hadders-Algra, M. (2011). Pediatric physical therapy in infancy: from nightmare to dream? A two-arm randomized trial. *Physical Therapy, 91*(9), 1323-1338. doi:10.2522/ptj.20100205

Blauw-Hospers, C. H., & Hadders-Algra, M. (2005). A systematic review of the effects of early intervention on motor development. *Developmental Medicine and Child Neurology, 47*(6), 421-432.

Borbasi, S., Jackson, D., & Wilkes, L. (2005). Fieldwork in nursing research: positionality, practicalities and predicaments. *Journal of Advanced Nursing, 51*(5), 493-501. doi:10.1111/j.1365-2648.2005.03523.x

Boyle, J. D., & Boyle, E. M. (2013). Born just a few weeks early: does it matter? *Arch Dis Child Fetal Neonatal Ed, 98*(1), F85-F88. doi:10.1136/archdischild-2011-300535

Brett, J., Staniszewska, S., Newburn, M., Jones, N., & Taylor, L. (2011). A systematic mapping review of effective interventions for communicating with, supporting and providing information to parents of preterm infants. *BMJ Open, 1*(1), e000023. doi:10.1136/bmjopen-2010-000023

Brodal, P. (2010). *The central nervous system: structure and function* (4th ed.). Oxford: Oxford University Press.

Bucher, H., Killer, C., Ochsner, Y., Vaihinger, S., & Fauchère, J.-C. (2002). Growth, developmental milestones and health problems in the first 2 years in very preterm infants compared with term infants: a population based study. *European journal of pediatrics, 161*(3), 151-156. doi:10.1007/s00431-001-0898-0

Burnett, A. C., Scratch, S. E., Lee, K. J., Cheong, J., Searle, K., Hutchinson, E., . . . Anderson, P. J. (2015). Executive Function in Adolescents Born <1000 g or <28 Weeks: A Prospective Cohort Study. *Pediatrics, 135*(4), e826-e834. doi:10.1542/peds.2014-3188

Bylund, B., Cervin, T., Finnstrom, O., Gaddlin, P. O., Kernell, A., Leijon, I., . . . Warngard, O. (1998). Morbidity and neurological function of very low birthweight infants from the newborn period to 4 y of age. A prospective study from the south-east region of Sweden. *Acta Paediatrica, 87*(7), 758-763.

Campbell, S. K., Palisano, R. J., & Orlin, M. N. (2012). *Physical therapy for children* (4th ed.). St. Louis: Elsevier Saunders.

Childress, D. C. (2011). Play behaviors of parents and their young children with disabilities. *Topics in Early Childhood Special Education, 31*(2), 112-120. doi:10.1177/0271121410390526

Cioni, G., Inguaggiato, E., & Sgandurra, G. (2016). Early intervention in neurodevelopmental disorders: underlying neural mechanisms. *Developmental Medicine and Child Neurology, 58 Suppl 4*, 61-66. doi:10.1111/dmcn.13050

Cress, C. J., Arens, K. B., & Zajicek, A. K. (2007). Comparison of engagement patterns of young children with developmental disabilities between structured and free play. *Education and Training in Developmental Disabilities, 42*(2), 152-164.

Creswell, J. W. (2007). *Qualitative inquiry & research design - choosing among five approaches* (2 ed.). Thousand Oaks, CA: Sage publications, Inc.

de Groot, L. (2000). Posture and motility in preterm infants. *Developmental Medicine and Child Neurology, 42*(1), 65-68.

de Groot, L., Hopkins, B., & Touwen, B. (1997). Motor asymmetries in preterm infants at 18 weeks corrected age and outcomes at 1 year. *Early Hum Dev, 48*(1-2), 35-46.

De Jaegher, H., & Di Paolo, E. A. (2007). Participatory sense-making: An enactive approach to social cognition. *Phenomenology and the Cognitive Sciences, 6*(4), 485-507. doi:10.1007/s11097-007-9076-9

De Jaegher, H., Peräkylä, A., & Stevanovic, M. (2016). The co-creation of meaningful action: Bridging enaction and interactional sociology. *Philosophical Transactions of the Royal Society B: Biological Sciences, 371*(1693), 20150378. doi:10.1098/rstb.2015.0378

Deatrick, J. A., Knafl, K. A., & Murphy-Moore, C. (1999). Clarifying the concept of normalization. *Journal of Nursing Scholarship, 31*(3), 209-214. doi:10.1111/j.1547-5069.1999.tb00482.x

Di Paolo, E. A., & De Jaegher, H. (2015). Towards an Embodied Science of Intersubjectivity: Widening the scope of social understanding research. *Frontiers in Psychology, 6*. doi:10.3389/fpsyg.2015.00234

Di Paolo, E. A., & De Jaegher, H. (Forthcoming). Neither individualistic, nor interactionist. In C. Durt, T. Fuchs, & C. Tewes (Eds.), *Embodiment, enaction, and culture*: MIT Press.

Di Paolo, E. A., Rohde, M., & De Jaegher, H. (2010). Horizons for the enactive mind: values, social interaction, and play. In J. Stewart, O. Gapenne, & E. A. Di Paolo (Eds.), *Enaction: towards a new paradigm for cognitive science*. Cambridge MIT Press.

Dirks, T., Blauw-Hospers, C. H., Hulshof, L. J., & Hadders-Algra, M. (2011). Differences between the family-centered "COPCA" program and traditional infant physical therapy based on neurodevelopmental treatment principles. *Physical Therapy, 91*(9), 1303-1322. doi:10.2522/ptj.20100207

Dirks, T., & Hadders-Algra, M. (2011). The role of the family in intervention of infants at high risk of cerebral palsy: a systematic analysis. *Developmental Medicine and Child Neurology, 53 Suppl 4*, 62-67. doi:10.1111/j.1469-8749.2011.04067.x

Duerden, E. G., Taylor, M. J., & Miller, S. P. (2013). Brain development in infants born preterm: looking beyond injury. *Seminars in Pediatric Neurology, 20*(2), 65-74. doi:10.1016/j.spen.2013.06.007

Dusing, S. C., & Harbourne, R. T. (2010). Variability in postural control during infancy: implications for development, assessment, and intervention. *Physical Therapy, 90*(12), 1838-1849. doi:10.2522/ptj.2010033

Dusing, S. C., Murray, T., & Stern, M. (2008). Parent preferences for motor development education in the neonatal intensive care unit. *Pediatric Physical Therapy, 20*(4), 363-368. doi:10.1097/PEP.0b013e31818add5d

Dusing, S. C., Thacker, L. R., & Galloway, J. C. (2016). Infant born preterm have delayed development of adaptive postural control in the first 5 months of life. *Infant Behavior and Development, 44*, 49-58. doi:http://dx.doi.org/10.1016/j.infbeh.2016.05.002

Dusing, S. C., Van Drew, C. M., & Brown, S. E. (2012). Instituting Parent Education Practices in the Neonatal Intensive Care Unit: An Administrative Case Report of Practice Evaluation and Statewide Action. *Physical Therapy, 92*(7). doi:10.2522/ptj.20110360

Edelman, G. M. (1987). *Neural Darwinism: the theory of neuronal group selection*. New York: Basic Books.

Edwards, I., Braunack-Mayer, A., & Jones, M. (2005). Ethical reasoning as a clinical-reasoning strategy in physiotherapy. *Physiotherapy, 91*(4), 229-236. doi:http://dx.doi.org/10.1016/j.physio.2005.01.010

Edwards, I., Jones, M., Carr, J., Braunack-Mayer, A., & Jensen, G. (2004). Clinical Reasoning Strategies in Physical Therapy. *Physical Therapy, 84*(4), 312-330.

Fallang, B. (2004). *Development in infants born preterm.* (Ph.D), University of Oslo, Oslo.

Fallang, B., & Hadders-Algra, M. (2005). Postural behavior in children born preterm. *Neural plasticity, 12*(2-3), 175-182; discussion 263-172.

Fallang, B., Saugstad, O. D., Grogaard, J., & Hadders-Algra, M. (2003). Kinematic quality of reaching movements in preterm infants. *Pediatr Res, 53*(5), 836-842. doi:10.1203/01.PDR.0000058925.94994.BC

Fallang, B., Saugstad, O. D., & Hadders-Algra, M. (2003). Postural adjustments in preterm infants at 4 and 6 months post-term during voluntary reaching in supine position. *Pediatr Res, 54*(6), 826-833. doi:10.1203/01.PDR.0000088072.64794.F3

Fantasia, V., De Jaegher, H., & Fasulo, A. (2014). We can work it out: An enactive look at cooperation. *Frontiers in Psychology, 5*. doi:10.3389/fpsyg.2014.00874

Fantasia, V., Markova, G., Fasulo, A., Costall, A., & Reddy, V. (2015). Not Just Being Lifted: Infants are Sensitive to Delay During a Pick-Up Routine. *Frontiers in Psychology, 6*. doi:10.3389/fpsyg.2015.02065

Fawke, J. (2007). Neurological outcomes following preterm birth. *Semin Fetal Neonatal Med, 12*(5), 374-382. doi:10.1016/j.siny.2007.06.002

Forcada-Guex, M., Pierrehumbert, B., Borghini, A., Moessinger, A., & Muller-Nix, C. (2006). Early dyadic patterns of mother-infant interactions and outcomes of prematurity at 18 months. *Pediatrics, 118*(1), e107-114. doi:10.1542/peds.2005-1145

Fuchs, T., & De Jaegher, H. (2009). Enactive intersubjectivity: Participatory sense-making and mutual incorporation. *Phenomenology and the Cognitive Sciences, 8*(4), 465-486. doi:10.1007/s11097-009-9136-4

Furze, J., Nelson, K., O'Hare, M., Ortner, A., Threlkeld, A. J., & Jensen, G. M. (2013). Describing the clinical reasoning process: application of a model of enablement to a pediatric case. *Physiotherapy Theory and Practice, 29*(3), 222. doi:10.3109/09593985.2012.727204

Gallagher, S. (2005). *How the body shapes the mind*. Oxford: Clarendon press.

General Movement Trust. (2009). General movements trust - Prechtl's method on the qualitative assessment of general movements Retrieved from http://www.general-movements-trust.info/53/manual

Gibson, E. J. (1969). *Principles of perceptual learning and development*. New York: Appleton-Century-Crofts.

Goldstein, D. N., Cohn, E., & Coster, W. (2004). Enhancing participation for children with disabilities: application of the ICF enablement framework to pediatric physical therapist practice. *Pediatric Physical Therapy, 16*(2), 114-120. doi:10.1097/01.pep.0000127567.98619.62

Gorga, D., Stern, F. M., Ross, G., & Nagler, W. (1988). Neuromotor development of preterm and full-term infants. *Early Hum Dev, 18*(2-3), 137-149.

Graungaard, A. H., & Skov, L. (2007). Why do we need a diagnosis? A qualitative study of parents' experiences, coping and needs, when the newborn child is severely disabled. *Child: care, health and development, 33*(3), 296-307. doi:10.1111/j.1365-2214.2006.00666.x

Hadders-Algra, M. (2000a). The neuronal group selection theory: a framework to explain variation in normal motor development. *Developmental Medicine and Child Neurology, 42*(8), 566-572.

Hadders-Algra, M. (2000b). The neuronal group selection theory: promising principles for understanding and treating developmental motor disorders. *Developmental Medicine and Child Neurology, 42*(10), 707-715.

Hadders-Algra, M. (2005). Development of postural control during the first 18 months of life. *Neural plasticity, 12*(2-3), 99-108; discussion 263-172. doi:10.1155/NP.2005.99

Hadders-Algra, M. (2010). Variation and variability: key words in human motor development. *Physical Therapy, 90*(12), 1823-1837. doi:10.2522/ptj.20100006

Hadders-Algra, M., Brogren, E., Katz-Salamon, M., & Forssberg, H. (1999). Periventricular leucomalacia and preterm birth have different detrimental effects on postural adjustments. *Brain, 122 (Pt 4)*, 727-740.

Heath, C., Hindmarsh, J., & Luff, P. (2010). *Video in qualitative research: Analysing social interaction in everyday life*. Los Angeles: SAGE.

Heath, C., Luff, P., & Svensson, M. S. (2007). Video and qualitative research: Analysing medical practice and interaction. *Med Educ, 41*(1), 109-116. doi:10.1111/j.1365-2929.2006.02641.x

Heineman, K. R., Middelburg, K. J., & Hadders-Algra, M. (2010). Development of adaptive motor behaviour in typically developing infants. *Acta Paediatrica, 99*(4), 618-624. doi:10.1111/j.1651-2227.2009.01652.x

Lov om kommunale helse- og omsorgstjenester m.m. (helse- og omsorgstjenesteloven), (2011).

Helse og Omsorgsdepartementet. (2009). *Samhandlingsreformen: Rett behandling - på rett sted - til rett tid*. Oslo: Helse- og omsorgsdepartementet.

Hickman, R., McCoy, S. W., Long, T. M., & Rauh, M. J. (2011). Applying Contemporary Developmental and Movement Science Theories and Evidence to Early Intervention Practice. *Infants & Young Children, 24*(1), 29-41. doi:10.1097/IYC.0b013e3181f4a9b8

Hilden, P. K., & Middelthon, A. (2002). Kvalitative metoder i medisinsk forskning - et etnografisk perspektiv. *Tidsskrift for den Norske Lægeforening, 122*(25), 2473-2476.

Hilderman, C. G. E., & Harris, S. R. (2014). Early intervention post-hospital discharge for infants born preterm. *Physical Therapy, 94*(9), 1211.

Hughes, A. J., Redsell, S. A., & Glazebrook, C. (2016). Motor Development Interventions for Preterm Infants: A Systematic Review and Meta-analysis. *Pediatrics*. doi:10.1542/peds.2016-0147

Infant Motor Performance Scales. (2016). What is the Test of Infant Motor Performance (TIMP)? Retrieved from http://thetimp.com/about-our-tests

Institute of Medicine Committee on Understanding Premature, B., & Assuring Healthy, O. (2007). *The National Academies Collection: Reports funded by National Institutes of Health*. Retrieved from Washington (DC):

Jansen, L. M., Ketelaar, M., & Vermeer, A. (2003). Parental experience of participation in physical therapy for children with physical disabilities. *Developmental Medicine and Child Neurology, 45*(1), 58-69. doi:10.1111/j.1469-8749.2003.tb00861.x

Jensen, G. M., Gwyer, J., & Shepard, K. F. (2000). Expert practice in physical therapy. *Physical Therapy, 80*(1), 28-43.

Johnson, S. (2007). Cognitive and behavioural outcomes following very preterm birth. *Semin Fetal Neonatal Med, 12*(5), 363-373. doi:10.1016/j.siny.2007.05.004

Kaaresen, P. I., Rønning, J. A., Ulvund, S. E., & Dahl, L. B. (2006). A Randomized, Controlled trial of the Effectiveness of an Early-Intervention program in Reducing Parenting Stress After preterm Birth. *Pediatrics, 118*. doi:10.1542/peds.2005-1491

Karasik, L. B., Tamis-LeMonda, C. S., Adolph, K. E., & Dimitropoulou, K. A. (2008). How Mothers Encourage and Discourage Infants' Motor Actions. *Infancy, 13*(4), 366-392. doi:10.1080/15250000802188776

Kemp, P., & Turnbull, A. P. (2014). Coaching with parents in early intervention: An interdisciplinary research synthesis. *Infants and Young Children, 27*(4), 305-324. doi:10.1097/IYC.0000000000000018

Kenyon, L. K. (2013). The hypothesis-oriented pediatric focused algorithm: a framework for clinical reasoning in pediatric physical therapist practice. *Physical Therapy, 93*(3), 413-420. doi:10.2522/ptj.20120080

King, G., Currie, M., Bartlett, D. J., Gilpin, M., Willoughby, C., Tucker, M. A., . . . Baxter, D. (2007). The development of expertise in pediatric rehabilitation therapists: changes in approach, self-knowledge, and use of enabling and customizing strategies. *Developmental Neurorehabilitation, 10*(3), 223-240. doi:10.1080/17518420701302670

King, S., Teplicky, R., King, G., & Rosenbaum, P. (2004). Family-Centered Service for Children With Cerebral Palsy and Their Families: A Review of the Literature. *Seminars in Pediatric Neurology, 11*(1), 78-86.

Kinney, H. C. (2006). The near-term (late preterm) human brain and risk for periventricular leukomalacia: a review. *Seminars in Perinatology, 30*(2), 81-88. doi:10.1053/j.semperi.2006.02.006

Knafl, K. A., & Deatrick, J. A. (2003). Further refinement of the family management style framework. *Journal of Family Nursing, 9*(3), 232-256. doi:10.1177/1074840703255435

Korja, R., Lehtonen, L., & Latva, R. (2012). The effects of preterm birth on mother-infant interaction and attachment during the infant's first two years. *Acta Obstetricia et Gynecologica Scandinavica, 91*(2), 164-173. doi:10.1111/j.1600-0412.2011.01304.x

Kruijsen-Terpstra, A. J. A., Ketelaar, M., Boeije, H., Jongmans, M. J., Gorter, J. W., Verheijden, J., . . . Verschuren, O. (2014). Parents' experiences with physical and occupational therapy for their young child with cerebral palsy: a mixed studies review. *Child: care, health and development, 40*(6), 787-796. doi:10.1111/cch.12097

Kvale, S., & Brinkmann, S. (2009). *InterViews: learning the craft of qualitative research interviewing* (2nd ed.). Los Angeles: Sage Publications.

Landsem, I. P., Handegard, B. H., Tunby, J., Ulvund, S. E., & Ronning, J. A. (2014). Early intervention program reduces stress in parents of preterms during childhood, a randomized controlled trial. *Trials, 15*, 387. doi:10.1186/1745-6215-15-387

Landsem, I. P., Handegard, B. H., Ulvund, S. E., Kaaresen, P. I., & Ronning, J. A. (2015). Early intervention influences positively quality of life as reported by prematurely born children at age nine and their parents; a randomized clinical trial. *Health and Quality of Life Outcomes, 13*, 25. doi:10.1186/s12955-015-0221-9

Levitt, S. (2010). *Treatment of cerebral palsy and motor delay* (5th ed.): Wiley-Blackwell.

Lifter, K., Foster-Sanda, S., Arzamarski, C., Briesch, J., & McClure, E. (2011). Overview of play: Its uses and importance in early intervention/early childhood special education. *Infants and Young Children, 24*(3), 225-245. doi:10.1097/IYC.0b013e31821e995c

Lifter, K., Mason, E. J., & Barton, E. E. (2011). Children's play: Where we have been and where we could go. *Journal of Early Intervention, 33*(4), 281-297. doi:10.1177/1053815111429465

Lobo, M. A., Harbourne, R. T., Dusing, S. C., & McCoy, S. W. (2013). Grounding early intervention: physical therapy cannot just be about motor skills anymore. *Physical Therapy, 93*(1), 94-103. doi:10.2522/ptj.20120158

Lotze, M., Braun, C., Birbaumer, N., Anders, S., & Cohen, L. G. (2003). Motor learning elicited by voluntary drive. *Brain, 126*, 866-872. doi:10.1093/brain/awg079

Mahoney, G., Robinson, C., & Perales, F. (2004). Early motor intervention - The need for new treatment paradigms. *Infants and Young Children, 17*(4), 291-300.

Malterud, K. (2001). Qualitative research: Standards, challenges, and guidelines. *The Lancet, 358*, 483-488. doi:10.1016/S0140-6736(01)05627-6

Malterud, K. (2012). Systematic text condensation: A strategy for qualitative analysis. *Scandinavian Journal of Public Health, 40*, 795-805. doi:10.1177/1403494812465030

Malterud, K. (2016). Theory and interpretation in qualitative studies from general practice: Why and how? *Scandinavian Journal of Public Health, 44*(2), 120-129. doi:10.1177/1403494815621181

Markestad, T., & Halvorsen, B. (2007). *Faglige retningslinjer for oppfølging av for tidlig fødte barn*. Sosial- og helsedirektoratet, Avdeling sykehustjenester. Retrieved from http://www.helsedirektoratet.no/publikasjoner/nasjonale-faglige-retningslinjer-for-oppfolging-

av-for-tidlig-fodte-barn/Publikasjoner/nasjonale-faglige-retningslinjer-for-oppfolging-av-for-tidlig-fodte-barn.pdf.

Marlow, N., Hennessy, E. M., Bracewell, M. A., Wolke, D., & Group, E. P. S. (2007). Motor and executive function at 6 years of age after extremely preterm birth. *Pediatrics, 120*(4), 793-804. doi:10.1542/peds.2007-0440

Mays, N., & Pope, C. (1995). Qualitative Research: Rigour and qualitative research. *BMJ, 311*(6997), 109-112. doi:10.1136/bmj.311.6997.109

McLaughlin, J., & Goodley, D. (2008). Seeking and rejecting certainty: Exposing the sophisticated lifeworlds of parents of disabled babies. *Sociology, 42*(2), 317-335. doi:10.1177/0038038507087356

Moore, G. P., Lemyre, B., Barrowman, N., & Daboval, T. (2013). Neurodevelopmental outcomes at 4 to 8 Years of children born at 22 to 25 weeks' gestational age: A meta-analysis. *Jama Pediatrics, 167*(10), 967-974. doi:10.1001/jamapediatrics.2013.2395

Nicholls, D. A., & Gibson, B. E. (2010). The body and physiotherapy. *Physiotherapy Theory and Practice, 26*(8), 497-509. doi:10.3109/09593981003710316

Norhov, S. M., Rønning, J. A., Dahl, L. B., Ulvund, S. E., Tunby, J., & Kaaresen, P. I. (2010). Early Intervention Improves Cognitive Outcomes for Preterm Infants: randomized Controlled Trial. *Pediatrics, 126*. doi:10.1542/peds.2010-0778

Orton, J., Spittle, A., Doyle, L., Anderson, P., & Boyd, R. (2009). Do early intervention programmes improve cognitive and motor outcomes for preterm infants after discharge? A systematic review. *Developmental Medicine and Child Neurology, 51*(11), 851-859.

Pelchat, D., & Lefebvre, H. (2004). A holistic intervention programme for families with a child with a disability. *Journal of Advanced Nursing, 48*(2), 124-131. doi:10.1111/j.1365-2648.2004.03179.x

Pelchat, D., Levert, M.-J., & Bourgeois-Guérin, V. (2009). How do mothers and fathers who have a child with a disability describe their adaptation/ transformation process? *Journal of Child Health Care, 13*(3), 239-259. doi:10.1177/1367493509336684

Peterson, C. A., Luze, G. J., Eshbaugh, E. M., Jeon, H.-J., & Kantz, K. R. (2007). Enhancing Parent-Child Interactions through Home Visiting: Promising Practice or Unfulfilled Promise? *Journal of Early Intervention, 29*(2), 119-140. doi:10.1177/105381510702900205

Piggot, J., Paterson, J., & Hocking, C. (2002). Participation in home therapy programs for children with cerebral palsy: a compelling challenge. *Qualitative Health Research, 12*(8), 1112-1129. doi:10.1177/104973202129120476

Pin, T., Eldridge, B., & Galea, M. (2010). Motor trajectories from 4 to 18 months corrected age in infants born at less than 30 weeks of gestation. *Early Hum Dev, 86*. doi:10.1016/j.earlhumdev.2010.07.008

Piper, M. C., & Darrah, J. (1994). *Motor assessment of the developing infant.* Philadelphia: Saunders.

QSR International Pty Ltd. (2012). NVivo qualitative data analysis software Version 10.

Reddy, V., Markova, G., & Wallot, S. (2013). Anticipatory Adjustments to Being Picked Up in Infancy. *PLoS One, 8*(6). doi:10.1371/journal.pone.0065289

Reddy, V., & Morris, P. (2004). Participants don't need theories - Knowing minds in engagement. *Theory & Psychology, 14*(5), 647-665. doi:10.1177/0959354304046177

Reid, D. A., & Mgombelo, J. (2015). Survey of key concepts in enactivist theory and methodology. *ZDM Mathematics Education, 47*(2), 171-183. doi:10.1007/s11858-014-0634-7

Rochat, P. (2001). *The infant's world*. Cambrigde, MA, USA: Harvard University Press.

Rossmanith, N., Costall, A., Reichelt, A. F., López, B., & Reddy, V. (2014). Jointly structuring triadic spaces of meaning and action: Book sharing from 3 months on. *Frontiers in Psychology, 5*. doi:10.3389/fpsyg.2014.01390

Samsom, J. F., & de Groot, L. (2001). Study of a group of extremely preterm infants (25-27 weeks): how do they function at 1 year of age? *J Child Neurol, 16*(11), 832-837.

Sansavini, A., Pentimonti, J., Justice, L., Guarini, A., Savini, S., Alessandroni, R., & Faldella, G. (2014). Language, motor and cognitive development of extremely preterm children: Modeling individual growth trajectories over the first three years of life. *Journal of Communication Disorders, 49*(0), 55-68. doi:http://dx.doi.org/10.1016/j.jcomdis.2014.02.005

Scales, L. H., McEwen, I. R., & Murray, C. (2007). Parents' perceived benefits of physical therapists' direct intervention compared with parental instruction in early intervention. *Pediatric Physical Therapy, 19*(3), 196-202. doi:10.1097/PEP.0b013e3180cabc57

Schappin, R., Wijnroks, L., Uniken Venema, M. M., & Jongmans, M. J. (2013). Rethinking stress in parents of preterm infants: a meta-analysis. *PLoS One, 8*(2), e54992. doi:10.1371/journal.pone.0054992

Sheets-Johnstone, M. (2011). *The Primacy of Movement: Expanded second edition* (2nd ed.). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Shepherd, R. B. (2013). *Cerebral Palsy in Infancy: targeted activity to optimize early growth and development*. London: Elsevier Health Sciences UK.

Shumway-Cook, A., & Woollacott, M. H. (2012). *Motor control: translating research into clinical practice* (4th ed.). Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins.

Smith, L. B., & Thelen, E. (2003). Development as a dynamic system. *Trends in Cognitive Sciences, 7*(8), 343-348. doi:10.1016/s1364-6613(03)00156-6

Spittle, A., Orton, J., Anderson, P., Boyd, R., & Doyle, L. W. (2012). Early developmental intervention programmes post-hospital discharge to prevent motor and cognitive impairments in preterm infants. *The Cochrane Database of Systematic Reviews, 12*. doi:10.1002/14651858.CD005495.pub3

Stavanger kommune. (2006). Oppfølging av små premature barn i Stavanger. In S. kommune (Ed.): Impress.

Stige, B., Malterud, K., & Midtgarden, T. (2009). Toward an agenda for evaluation of qualitative research. *Qualitative Health Research, 19*(10), 1504-1516. doi:10.1177/1049732309348501

Symington, A., & Pinelli, J. (2006). Developmental care for promoting development and preventing morbidity in preterm infants. *Cochrane Database of Systematic Reviews*(2), CD001814. doi:10.1002/14651858.CD001814.pub2

Taylor, S. J., Bogdan, R., & DeVault, M. (2015). *Introduction to Qualitative Research Methods: A Guidebook and Resource*. New Jersey John Wiley & Sons.

The United States Social Security Administration. (2016). Social Security Programs Throughout the World: Europe, 2010. Retrieved from https://www.ssa.gov/policy/docs/progdesc/ssptw/2010-2011/europe/norway.html

Thompson, E. (2005). Sensorimotor subjectivity and the enactive approach to experience. *Phenomenology and the Cognitive Sciences, 4*(4), 407-427. doi:10.1007/s11097-005-9003-x

Treyvaud, K. (2013). Parent and family outcomes following very preterm or very low birth weight birth: A review. *Seminars in Fetal and Neonatal Medicine, 19*(2), 131-135. doi:10.1016/j.siny.2013.10.008

Treyvaud, K., Anderson, V. A., Howard, K., Bear, M., Hunt, R. W., Doyle, L., . . . Anderson, P. (2009). Parenting behavior is associated with the early neurobehavioral development of very preterm children. *Pediatrics, 123*(2), 555-561. doi:10.1542/peds.2008-0477

Tripathi, T., & Dusing, S. C. (2015). Long-term neurodevelopmental outcomes of infants born late preterm: a systematic review. *Research and Reports in Neonatology, 5*, 91. doi:10.2147/RRN.S44062

Ustad, T., Evensen, K. A. I., Campbell, S. K., Girolami, G. L., Helbostad, J., Jørgensen, L., . . . Øberg, G. K. (2016). Early Parent-Administered Physical Therapy for Preterm Infants: A Randomized Controlled Trial. *Pediatrics, 138*(2). doi:10.1542/peds.2016-0271

van der Fits, I. B., Flikweert, E. R., Stremmelaar, E. F., Martijn, A., & Hadders-Algra, M. (1999). Development of postural adjustments during reaching in preterm infants. *Pediatr Res, 46*(1), 1-7.

van Haastert, I. C., de Vries, L. S., Helders, P. J., & Jongmans, M. J. (2006). Early gross motor development of preterm infants according to the Alberta Infant Motor Scale. *J Pediatr, 149*(5), 617-622. doi:10.1016/j.jpeds.2006.07.025

Vanderveen, J. A., Bassler, D., Robertson, C. M., & Kirpalani, H. (2009). Early interventions involving parents to improve neurodevelopmental outcomes of premature infants: a meta-analysis. *Journal of Perinatology, 29*(5), 343-351. doi:10.1038/jp.2008.229

Varela, F. J., Thompson, E., & Rosch, E. (1991). *The embodied mind: cognitive science and human experience*. Cambridge, Mass: MIT Press.

Vig, S. (2007). Young children's object play: A window on development. *Journal of Developmental and Physical Disabilities, 19*(3), 201-215. doi:DOI 10.1007/s10882-007-9048-6

von Hofsten, C. (2004). An action perspective on motor development. *Trends in Cognitive Sciences, 8*(6), 266-272. doi:http://dx.doi.org/10.1016/j.tics.2004.04.002

Von Hofsten, C. (2007). Action in development. *Developmental science, 10*(1), 54.

Wallin, L., & Eriksson, M. (2009). Newborn Individual Development Care and Assessment Program (NIDCAP): a systematic review of the literature. *Worldviews on Evidence-Based Nursing, 6*(2), 54-69. doi:10.1111/j.1741-6787.2009.00150.x

Wang, T.-L., & Lien, Y.-H. (2013). The power of using video data. *International Journal of Methodology, 47*(5), 2933-2941. doi:10.1007/s11135-012-9717-0

Watson, C. K., Kieckhefer, G. M., & Olshansky, E. (2006). Striving for therapeutic relationships: Parent-provider communication in the developmental treatment setting. *Qualitative Health Research, 16*(5), 647-663. doi:10.1177/1049732305285959

WHO. (2000). The world health report 2000 - Health Systems: Improving performance. Retrieved from http://www.who.int/whr/2000/en/whr00_en.pdf

Wolf, M. J., Koldewijn, K., Beelen, A., Smit, B., Hedlund, R., & de Groot, I. J. M. (2002). Neurobehavioral and developmental profile of very low birthweight preterm infants in early infancy. *Acta Paediatrica, 91*(8), 930-938. doi:Doi 10.1080/080352502760148667

World Medical Association. (2013). WMA Declaration of Helsinki - Ethical principles for medical research involving human subjects. Retrieved from http://www.wma.net/en/30publications/10policies/b3/

Zahavi, D. (2004). The embodied self-awareness of the infant: A challenge to the theory-theory of mind? In D. Zahavi, T. Grèunbaum, & J. Parnas (Eds.), The structure and development of self-consciousness : interdisciplinary perspectives. In M. I. Stamenov (Series Ed.) Advances in Consciousness Research (Vol. 59, pp. 35-63). Amsterdam Philadelphia, PA: John Benjamins Publishing company.

Øberg, G. K., Blanchard, Y., & Obstfelder, A. (2014). Therapeutic encounters with preterm infants: Interaction, posture and movement. *Physiotherapy Theory and Practice, 30*(1), 1-5. doi:10.3109/09593985.2013.806621

Øberg, G. K., Campbell, S. K., Girolami, G. L., Ustad, T., Jørgensen, L., & Kaaresen, P. I. (2012). Study protocol: An early intervention program to improve motor outcome in preterm infants: A randomized controlled trial and a qualitative study of physiotherapy performance and parental experiences. *BMC pediatrics, 12*(1), 1-9. doi:10.1186/1471-2431-12-15

Øberg, G. K., Normann, B., & Gallagher, S. (2015). Embodied-enactive clinical reasoning in physical therapy. *Physiotherapy Theory and Practice, 31*(4), 244-252. doi:doi:10.3109/09593985.2014.1002873

Appendix 1

Tilråding av behandling av personopplysinger NSD

Ethical approval NSD

Norsk samfunnsvitenskapelig datatjeneste AS
NORWEGIAN SOCIAL SCIENCE DATA SERVICES

Harald Hårfagres gate 29
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MH-bygget
9037 TROMSØ

Vår dato: 24.01.2012 Vår ref: 29259 / 3 / HIT Deres dato: Deres ref:

TILRÅDING AV BEHANDLING AV PERSONOPPLYSNINGER

Vi viser til melding om behandling av personopplysninger, mottatt 05.01.2012. All nødvendig informasjon om prosjektet forelå i sin helhet 23.01.2012. Meldingen gjelder prosjektet:

29259	*Fysioterapi i førstelinjetjenesten, et helhetlig tilbud til for tidlig fødte barn og deres foreldre*
Behandlingsansvarlig	*Universitetet i Tromsø, ved institusjonens øverste leder*
Daglig ansvarlig	*Ragnhild Håkstad*

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, eventuelle kommentarer samt personopplysningsloven/-helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema, http://www.nsd.uib.no/personvern/forsk_stud/skjema.html. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database, http://www.nsd.uib.no/personvern/prosjektoversikt.jsp.

Personvernombudet vil ved prosjektets avslutning, 04.12.2015, rette en henvendelse angående status for behandlingen av personopplysninger.

Vennlig hilsen

Knut Kalgraff Skjåk

Hildur Thorarensen

Kontaktperson: Hildur Thorarensen tlf: 55 58 26 54
Vedlegg: Prosjektvurdering

Personvernombudet for forskning

Prosjektvurdering - Kommentar

Prosjektnr: 29259

Prosjektets formål er å øke kunnskapen når det gjelder om, og eventuelt på hvilken måte kommunefysioterapeuter bidrar til å fremme premature barns bevegelsesutvikling og imøtekommer den enkelte families behov. Prosjektet er meldt til REK, som har vedtatt at det faller utenfor helseforskningsloven (2011/2152/REK nord).

Utvalget består av ca. 8-10 for tidlig fødte barn som har blitt henvist til fysioterapeut, og som deltar i intervensjonsprosjektet ("Individuelt tilpasset fysioterapi til for tidlig fødte barn på Nyfødt intensiv avdeling og foreldremedvirkning: effekt og erfaringer"), barnas foreldre, samt deres lokale fysioterapeut. Rekruttering skjer ved at fysioterapeuter ved sykehuset deler ut informasjonsskriv til aktuelle foreldre, som bes om å ta kontakt med forsker om de vil delta.

Det innhentes skriftlig samtykke fra foreldre og fysioterapeuter, basert på skriftlig informasjon.

Personvernombudet finner informasjonsskrivene tilfredsstillende, forutsatt følgende endringer:
- det bør presiseres i skrivet til foreldrene at fysioterapeutene intervjues om det aktuelle barnet og samarbeidet med foreldrene, ev. kan det også presiseres i samtykkeerklæringen at de samtykker til å oppheve fysioterapeutens taushetsplikt.
- i avsnittet "Hva skjer med informasjonen om deg", etter setningen "Det vil så langt som mulig (...)" bør følgende setning tilføyes: "Dersom vi ser at det blir vanskelig å anonymisere deg og/eller ditt barn vil du få informasjon om dette, samt mulighet til å lese igjennom før det publiseres."
- det bør opplyses om at formålet med lagring av datamaterialet i fem år etter prosjektslutt er eventuelle oppfølgingsstudier, og at deltakerne i så tilfelle vil få ny informasjon og det vil innhentes nytt samtykke (jf telefonsamtale 23.01.2012), samt at datamaterialet slettes/anonymiseres etter fem år.

Vi ber om å få tilsendt revidert skriv før dette distribueres til utvalget.

Datamaterialet samles inn ved hjelp av personlig intervju med foreldre og fysioterapeut, og (video)observasjon av fysioterapitime og hjemmesituasjon. I tillegg vil det muligens bli benyttet data fra journal og medisinske undersøkelser tilknyttet det større intervensjonsprosjektet.

Direkte og indirekte personopplysninger vil bli samlet inn. Det vil bli opprettet manuell koblingsnøkkel som oppbevares i låsbart skap. Video-/lydopptak overføres til server beskyttet av brukernavn og passord, og slettes fortløpende fra bærbar enhet. Øvrig datamateriale vil bli oppbevart på datamaskin tilknyttet virksomheten, beskyttet av brukernavn og passord. Kun autorisert personale tilknyttet prosjektet vil har tilgang.

Det oppgis at det vil bli registrert sensitive personopplysninger om helseforhold, jf. personopplysningsloven § 2 nr. 8 c). Personvernombudet finner at opplysningene kan behandles med hjemmel i personopplysningsloven § 8 første alternativ og § 9 a).

Prosjektet er planlagt avsluttet 04.12.2015. Etter prosjektslutt vil datamaterialet lagres i fem år av hensyn til eventuelle oppfølgingsstudier. Datamaterialet anonymiseres innen 05.12.2020. For at datamaterialet skal være anonymt må navn (på samtykkeerklæringer og koblingsnøkkel) slettes. I

tillegg må indirekte personidentifiserende opplysninger slettes eller grovkategoriseres/omskrives, slik at ingen enkeltpersoner kan gjenkjennes. Videoopptak og annen direkte personidentifiserbar informasjon slettes.

Appendix 2

Informasjonsskriv foreldre

(Informed consent letter parents)

Forespørsel om deltakelse i forskningsprosjektet

"Fysioterapi i førstelinjetjenesten, et helhetlig tilbud til for tidlig fødte barn og deres foreldre."

Bakgrunn og hensikt

Dette er et spørsmål til deg om å delta i en forskningsstudie for å øke kunnskapen når det gjelder om, og eventuelt på hvilken måte kommunefysioterapeuter bidrar til å fremme premature barns bevegelsesutvikling og imøtekommer den enkelte families behov. Studiet er et doktorgradsprosjekt som inngår i det større forskningsprosjektet "*Individuelt tilpasset fysioterapi til for tidlig fødte barn på Nyfødt Intensiv avdeling og foreldremedvirkning: effekt og erfaringer"*. Dette større forskningsprosjektet har fokus på effekt av tidlig fysioterapi og på opplæringen av foreldrene mens de er på sykehuset. Noen av barna har behov for videre oppfølging av fysioterapeut etter at de har kommet hjem. I doktorgradsprosjektet er det kommunefysioterapeutenes møter med disse barna og deres foreldre, som vi skal studere. Møtene vil være spesielt egnet med tanke på å studere individuelt tilpasset fysioterapi og effekt, fordi barna og foreldrene er kjent med tanke på hva slags fysioterapi barna med foreldre har fått på sykehuset. Ved å se de to prosjektene og deres resultater i sammenheng, vil vi også kunne fremskaffe ny og nyttig kunnskap om helhetlige pasientforløp for premature barn og deres familier. Det er Institutt for Helse- og Omsorgsfag (IHO) ved Universitetet i Tromsø (UiT) som er ansvarlig for prosjektet.

Forespørselen rettes til deg fordi ditt barn allerede er med i prosjektet "*Individuelt tilpasset fysioterapi til for tidlig fødte barn på Nyfødt Intensiv avdeling og foreldremedvirkning: effekt og erfaringer"*, og fordi barnet ditt er henvist til videre oppfølging hos kommunefysioterapeut. Siden forespørselen rettes til deg via fysioterapeut på sykehuset, er din identitet ukjent for forskeren frem til du eventuelt samtykker i å delta ved å returnere samtykkeerklæringen. Det vil bli innhentet eget samtykke fra den lokale fysioterapeuten.

Hva innebærer studien?

8 til 10 barn med foreldre planlegges med. En forsker (fysioterapeut og stipendiat Ragnhild B. Håkstad) vil komme til hjemplassen deres 3 ganger; først ved 3-4 mnd alder, deretter når barnet er 6 og 12 måneder gammelt. I forbindelse med disse besøkene vil hun gjennomføre observasjon med videoopptak av fysioterapibehandlingene. Hun vil også gjennomføre intervju med dere foreldre og med fysioterapeuten. Tema i intervjuene vil være oppfølgingen av barnet og samarbeidet mellom foreldre og fysioterapeut. Hvert intervju vil vare ca. 1 time og vil bli tatt opp på lydbånd.

Mulige fordeler og ulemper

Deltagelse i prosjektet innebærer at du har ansvar for at du og ditt barn så langt som mulig, møter til fysioterapi på avtalt tidspunkt og setter av tid til intervju i etterkant av behandlingen. Det vil kunne oppleves som mer eller mindre belastende for deg avhengig av dagsform og andre gjøremål. På den annen side vil du gjennom dine bidrag få mulighet til å formidle hva du som forelder opplever som vesentlig i sammenheng med oppfølging hos kommunefysioterapeut. Det vil ikke påløpe noen utgifter ved å delta i prosjektet.

Hva skjer med informasjonen om deg?

Opplysninger som registreres er foreldrenes og barnets navn, adresse og telefonnummer, samt kontaktopplysninger til deres lokale fysioterapeut. I tillegg vil barnets fødselsdato, opplysninger knyttet til fødselen, spedbarnsperioden og eventuelle diagnoser bli registrert. Forskeren vil også ha tilgang til å koble dette opp mot opplysninger i det større prosjektet *"Individuelt tilpasset fysioterapi til for tidlig fødte barn på Nyfødt Intensiv avdeling og foreldremedvirkning: effekt og erfaringer"*.

Forskeren er underlagt taushetsplikt og all data behandles konfidensielt. Skriftlig materiale fra intervju og observasjoner vil være avidentifisert. Det er kun autorisert personell knyttet til prosjektet som har

adgang til navnelisten og som kan finne tilbake til deg. Alle identifiserbare personopplysninger, video- og lydopptak vil bli oppbevart i låsbart skap eller elektronisk på lukket server. Med tanke på eventuelle oppfølgingsstudier vil materialet bli oppbevart i 5 år etter at prosjektet avsluttes i desember 2015. Ved eventuell videre anvendelse av materialet vil dere få ny informasjon om dette og det vil innhentes nytt samtykke fra dere. Etter 5 år vil materialet slettes/ anonymiseres.

Det vil så langt som mulig søkes å publisere resultatene slik at verken barnet ditt eller du kan identifiseres. Dersom vi ser at det blir vanskelig å anonymisere deg og/ eller ditt barn vil du få informasjon om dette samt mulighet til å lese igjennom før det publiseres.

Hvis du sier ja til å delta i studien, har du rett til å få innsyn i hvilke opplysninger som er registrert om ditt barn og deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene som er registrert.

Universitetet i Tromsø ved universitetsdirektøren er ansvarlig for behandling av personopplysninger. Prosjektet er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Frivillig deltakelse
Det er frivillig å delta i studien. Om du nå sier ja til å delta, kan du når som helst og uten å oppgi noen grunn trekke ditt samtykke. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner. Å trekke seg fra studien vil ikke få konsekvenser for ditt barns behandling, verken hos kommunefysioterapeuten eller på sykehuset. Dersom du ikke ønsker å være med i studien vil det ikke ha betydning for oppfølgingen barnet ditt får.

Dersom du sier ja til å delta har du rett til å få informasjon om resultatet av studien. Informasjon om resultater og publiserte artikler vil du kunne få ved å henvende deg til stipendiat Ragnhild B. Håkstad.

Dersom du ønsker å delta, fyller du ut og undertegner samtykkeerklæringen på siste side og sender denne i vedlagte svarkonvolutt til stipendiat Ragnhild B. Håkstad. Hun tar så kontakt med deg for nærmere avtale.

Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte prosjektleder Gunn Kristin Øberg, telefon: 77 75 58 68.

Forsker:
Spesialist i barnefysioterapi og stipendiat Ragnhild B. Håkstad
Institutt for helse- og omsorgsfag
Det helsevitenskapelige fakultet
Universitetet i Tromsø
Tlf: 77 66 07 11

Prosjektleder og veileder:
Spesialist i barnefysioterapi, PhD og førsteamanuensis Gunn Kristin Øberg
Institutt for helse- og omsorgsfag
Det helsevitenskapelige fakultet
Universitetet i Tromsø
Tlf: 77 75 58 68

Samtykke til deltakelse i studien

Jeg har mottatt skriftlig informasjon og er villig til å delta i studien "Fysioterapi i førstelinjetjenesten, et helhetlig tilbud til for tidlig fødte barn og deres foreldre". Jeg samtykker til at personopplysninger om meg behandles som beskrevet i informasjonsskrivet. Videre samtykker jeg til at fysioterapeutens taushetsplikt oppheves ved gjennomføring av intervju med forskeren.

Foreldres navn (blokkbokstaver)

_____

_____

Barnets navn (blokkbokstaver)

_____

Adresse:

_____

_____

Tlf: _____

Signatur:

(Signert av prosjektdeltaker, dato)

Appendix 3

Informasjonsskriv fysioterapeuter

(Informed consent letter physical therapists)

Forespørsel om deltakelse i forskningsprosjektet

"Fysioterapi i førstelinjetjenesten, et helhetlig tilbud til for tidlig fødte barn og deres foreldre."

Bakgrunn og hensikt

Dette er et spørsmål til deg om å delta i en forskningsstudie for å øke kunnskapen når det gjelder om, og eventuelt på hvilken måte kommunefysioterapeuter bidrar til å fremme premature barns bevegelsesutvikling og imøtekommer den enkelte families behov. Studiet er et doktorgradsprosjekt som inngår i det større forskningsprosjektet "*Individuelt tilpasset fysioterapi til for tidlig fødte barn på Nyfødt Intensiv avdeling og foreldremedvirkning: effekt og erfaringer"*. Dette større forskningsprosjektet har fokus på effekt av tidlig fysioterapi og på opplæringen av foreldrene mens de er på sykehuset. Noen av barna fra både intervensjonsgruppen og kontrollgruppen vil bli henvist til kommunefysioterapeuter for videre oppfølging. I doktorgradsprosjektet er det kommunefysioterapeutenes møter med disse barna og deres foreldre, som vi skal studere. Møtene vil være spesielt egnet med tanke på å studere individuelt tilpasset fysioterapi og effekt, fordi barna og foreldrene er kjent med tanke på hva slags fysioterapi barna med foreldre har fått på sykehuset. Ved å se de to prosjektene og deres resultater i sammenheng, vil vi også kunne fremskaffe ny og nyttig kunnskap om helhetlige pasientforløp for premature barn og deres familier.

Forespørselen rettes til deg fordi foreldrene til et barn som har samtykket til å delta i prosjektet, har oppgitt deg som behandlende fysioterapeut i kommunen. Det er Institutt for Helse- og Omsorgsfag (IHO) ved Universitetet i Tromsø (UiT) som er ansvarlig for prosjektet.

Hva innebærer studien?

8 til 10 barn med foreldre og lokal fysioterapeut planlegges med. Fysioterapeut og stipendiat Ragnhild B. Håkstad vil komme til dere 3 ganger; først ved 3-4 mnd alder, deretter når barnet er 6 og 12 måneder gammelt. I forbindelse med disse besøkene vil hun gjennomføre observasjon med videoopptak av fysioterapibehandlingene, samt gjennomføre intervju med foreldre og fysioterapeut. Tema i intervjuene vil være oppfølgingen av barnet og samarbeidet med foreldre. Intervjuene blir tatt opp på lydbånd og vil ta ca. 1 time hver.

Mulige fordeler og ulemper

Deltagelse i prosjektet vil innebære at du har ansvar for at observasjon og intervju så langt som mulig kan gjennomføres på avtalte tidspunkter. Ved å delta tillater du at forskeren er tilstede og gjøre video-opptak av din behandling med det aktuelle barnet, og du setter av tid til intervju etterpå. Det vil kunne oppleves som mer eller mindre belastende for deg avhengig av andre gjøremål. På den annen side vil du gjennom dine bidrag få mulighet til å formidle hva du som fysioterapeut opplever som vesentlig i sammenheng med oppfølgingen av for tidlig fødte barn i kommunen. Det vil ikke påløpe noen utgifter ved å delta i prosjektet.

Hva skjer med informasjonen om deg?

Opplysninger som registreres om deg er navn, kontaktopplysninger, utdanning og tidligere praksis som fysioterapeut. Forskeren er underlagt taushetsplikt og all data behandles konfidensielt. Skriftlig materiale fra intervju og observasjoner vil være avidentifisert. Det er kun autorisert personell knyttet til prosjektet som har adgang til navnelisten og som kan finne tilbake til deg. Alle identifiserbare personopplysninger, video- og lydopptak vil bli oppbevart i låsbart skap eller elektronisk på beskyttet server-område, og vil bli oppbevart i 5 år etter at prosjektet avsluttes i desember 2015. Med tanke på eventuelle oppfølgingsstudier vil materialet bli oppbevart i 5 år etter at prosjektet avsluttes i desember 2015. Ved eventuell videre anvendelse av materialet vil dere få ny informasjon om dette og det vil innhentes nytt samtykke fra deg. Etter 5 år vil materialet slettes/ anonymiseres.

Det vil så langt som mulig søkes å publisere resultatene slik at verken barnet, foreldrene eller du kan identifiseres. Dersom vi ser at det blir vanskelig å anonymisere deg vil du få informasjon om dette samt mulighet til å lese igjennom før det publiseres.

Hvis du sier ja til å delta i studien, har du rett til å få innsyn i hvilke opplysninger som er registrert om deg. Du har videre rett til å få korrigert eventuelle feil i de opplysningene som er registrert.

Universitetet i Tromsø ved universitetsdirektøren er ansvarlig for behandling av personopplysninger. Prosjektet er meldt til Personvernombudet for forskning, Norsk samfunnsvitenskapelig datatjeneste AS.

Dersom du sier ja til å delta har du rett til å få informasjon om resultatet av studien. Informasjon om resultater og publiserte artikler vil du kunne få ved å henvende deg til stipendiat Ragnhild Håkstad.

Frivillig deltakelse
Det er frivillig å delta i studien. Om du nå sier ja til å delta, kan du når som helst og uten å oppgi noen grunn trekke ditt samtykke til å delta i studien. Dersom du trekker deg fra studien, kan du kreve å få slettet innsamlede opplysninger, med mindre opplysningene allerede er inngått i analyser eller brukt i vitenskapelige publikasjoner. Dersom du ønsker å delta, fyller du ut og undertegner samtykkeerklæringen på siste side og sender denne i vedlagte svarkonvolutt til stipendiat Ragnhild B. Håkstad. Dersom du senere ønsker å trekke deg eller har spørsmål til studien, kan du kontakte prosjektleder Gunn Kristin Øberg, telefon: 77 75 58 68.

Forsker:
Spesialist i barnefysioterapi og stipendiat Ragnhild B. Håkstad
Institutt for helse- og omsorgsfag
Det helsevitenskapelige fakultet
Universitetet i Tromsø
Tlf: 77 66 07 11

Veileder:
Spesialist i barnefysioterapi, PhD og førsteamanuensis Gunn Kristin Øberg
Institutt for helse- og omsorgsfag
Det helsevitenskapelige fakultet
Universitetet i Tromsø
Tlf: 77 75 58 68

Medveileder:
Førsteamanuensis Aud Obstfelder
Institutt for helse- og omsorgsfag
Det helsevitenskapelige fakultet
Universitetet i Tromsø
Tlf: 77 64 62 14

Samtykke til deltakelse i studien

Jeg har mottatt skriftlig informasjon og er villig til å delta i studien “Fysioterapi i førstelinjetjenesten, et helhetlig tilbud til for tidlig fødte barn og deres foreldre”. Jeg samtykker til at personopplysninger om meg behandles som beskrevet i informasjonsskrivet.

Fysioterapeutens navn (blokkbokstaver):

_____

Adresse:

_____

_____

Tlf: _____

Signatur:

(Signert av prosjektdeltaker, dato)

Appendix 4

Observasjonsguide (norsk versjon)

Observation guide (English version)

Observasjon av fysioterapibehandling

Hovedpunkter	Underpunkter
Behandlingsomgivelser.	Hvordan er omgivelsene: lys, temperatur, størrelse på rommet. Hvordan organiseres rommet; plassering av utstyr, leker, barnet, foreldre og fysioterapeut.
Innholdet i fysioterapibehandlingen.	Barnets utgangsstillinger og aktiviteter. Fysioterapeutens tilrettelegging for og stimulering til aktivitet. Involvering av foreldre underveis i behandlingen. Veiledning av foreldre.
Samhandling/ samspill mellom fysioterapeut, barn og foreldre.	Barnets initiativ til aktivitet og fysioterapeutens respons på dette. Barnets respons på aktivitet initiert av fysioterapeut. Fysioterapeutens initiativ til involvering av foreldre, foreldres respons. Foreldres initiativ til deltagelse, fysioterapeutens respons på dette. Detaljer i samspillet: kroppslig samhandling, gester, mimikk, stemmebruk, turtaking.
Hvilke resultater/ endringer kan sees i løpet av behandlingstimen?	Barnets våkenhetstilstand. Barnets motoriske ferdigheter. Foreldrekompetanse.

Observation of physical therapy sessions

Main topic	Sub-topics
The treatment environment	Surroundings: light, temperature, size of the room. Organization of the room: placement of equipment and toys, the child, parents and PT.
The physical therapy content of the session	The child's positions and activities. The PTs adaptations and facilitation of activities. The involvement of parents during the treatment session. Education of parents.
Interaction/ interplay between PT, child and parents during the session	The child's activity initiatives and the PT's response to it. The child's response to activities initiated by the PT. The PT's initiatives of involving parents and the parents' response to it. Parents' initiatives to participate and the PT's response to it. Details of interaction: bodily interaction, gestures, mimicking, use of voice, turn taking.
Outcomes/ changes observed during the session	The child's state of arousal. The child's motor performance. The parents' competency.

Appendix 5

Intervju guide foreldre (norsk versjon)

Interview guide parents (English version)

Intervju med foreldre, generell intervjuguide.

Innledning:
Hva intervjuet skal handle om; barnet deres, dere foreldre og barnets fysioterapitilbud. Et viktig utgangspunkt for meg er at både barn, foreldre og fysioterapeuter er forskjellige – og har forskjellige måter å gjøre ting på, forskjellige behov. Det er ikke snakk om å finne frem til «rett eller galt», jeg ønsker å få høre om hvordan fysioterapitilbudet oppleves av nettopp dere, om hvordan det møter deres behov i hverdagen.
Hvordan det foregår; fint om du vil fortelle fritt, være så åpen som du selv vil. En samtale oss imellom mer enn «spørsmål og svar».

Åpningsspørsmål: Kan du starte med å fortelle meg om barnet ditt?

Tema: hvem er barnet?
Hva liker barnet ditt å gjøre? Hva er det som engasjerer barnet ditt?
Kan du fortelle om noen gode øyeblikk fra hverdagen?
Hvordan fungerer barnet i hverdagen? Mat, søvn, samspill, trivsel osv.
Kan du fortelle meg hvem dere som familie er? Hvordan fungerer deres hverdag? Hva er dere opptatt av?

Tema: dagens fysioterapibehandling.
Hvilke tanker har du om fysioterapibehandlingen som dere fikk i dag?
Kan du trekke frem noe du synes var spesielt bra ved dagens time?
Var det noe du ikke var like fornøyd med ved dagens time?
Har du noen tanker om samspillet mellom barnet-fysioterapeuten-deg underveis i timen?
Er det noe som du ser at du og barnet ditt kan ta med dere fra dagens time?
Noen konkrete episoder jeg vil trekke frem?

Tema: hvordan fungerer fysioterapien?
Hva ønsker / forventer du at fysioterapitilbudet skal bidra med i deres hverdag?
Kan du fortelle om hvordan en typisk fysioterapitime forløper?
Har du noen eksempler på gode opplevelser fra fysioterapien?
Har du eksempler på ting som du/ barnet har lært gjennom fysioterapitilbudet, som er tatt i bruk hjemme?
Hva tenker du om din rolle underveis i fysioterapitimen?
Har du noen tanker om hvordan du som foreldre best kan lære av fysioterapeuten?
Kan du si noe om hvordan du som foreldre opplever å bli ivaretatt?
Har du noen tanker om hvordan samspillet mellom barnet-fysioterapeuten-deg fungerer?
Kan du trekke frem noe som du er spesielt fornøyd med ved fysioterapitilbudet?
Er det noe ved fysioterapien du er mindre tilfreds med?
Hvordan synes du samarbeidet mellom fysioterapeut på sykehus og i kommunen fungerer?

Tema: tiden fra fødsel og frem til nå.
Hvordan var den første tiden etter fødselen?
Hva er det du husker best fra tiden på sykehuset?
Kan du fortelle meg om barnets form fra fødselen av og fremover?
Kan du fortelle om hvordan barnet har utviklet seg frem til nå?
Kan du si noe om hvordan dere har opplevd det å få et for tidlig født barn?

Tema: hva er viktig for dere nå og i tiden fremover?
Hva er det som er viktig for dere og for barnet ditt nå?
Hvilke tanker/ ønsker har du for barnet ditt i tiden som kommer?
Kan du si noe om hvordan du ser for deg at fysioterapien kan bidra i hverdagen deres i tiden som kommer?

Interview with parents, general guide.

Introduction:

What this interview is about; your child, you as parents and the physical therapy service you are receiving. It is important to me that both children, you as parents and the PTs are different – and have different ways to do things, have different needs. I am not searching for "right or wrong", but I want to hear about your perceptions of physical therapy and how the service can accommodate your needs.

How the interview proceeds; you are welcome to speak freely, be as open about things as you feel comfortable with. It is more like a conversation than "questions and answers".

Opening question: Could you start by telling me about your child?

Topic: Talking about the child.

What does your child like to do? What creates engagement for your child?
Can you tell me about some good moments from your everyday life?
How is the child doing in your everyday life? Food, sleep, interaction, wellbeing etc.
Can you tell me about you as a family? What is your everday like? What is important to you?

Topic: Today's physiotherapy session.

What are your thoughts regarding today's physical therapy sessions?
Can you point out something that you liked about today's session?
Was there anything you were less satisfied with today?
Do you have any thoughts about the interaction between the child-PT-yourself during the session?
Is there something that you and your child can take home from today's session?
Anything I (=researcher) want to point out?

Topic: Physiotherapy in general.

What contributions do you want, or expect, that the physical therapy service can provide in your everyday life?
Can you tell me how a physical therapy session typically proceeds?
Do you have an example of a good experience from physical therapy sessions?
Do you have examples of things that you or your child has learned during physical therapy, and that you have applied at home?
What are your thoughts regarding your role during therapy sessions?
Can you explain what it takes for you to best be able to learn from the PT?
Can you tell me how you as a parent feel that the PT is supportive of your needs?
Do you have any thoughts about the interactions between the child-PT-yourself during sessions?
Is there something that you are particularly satisfied with when it comes to the physical therapy service?
Are there things about the service with which you are less satisfied?
How do you perceive of the collaboration between the hospital PT and the municipality PT?

Topic: Experiences from birth to the present time.

How did you perceive of the first time after birth?
What do you remember most from your time at the hospital?
Can you tell me about your child's condition from birth up until now?
Can you tell me about your child's development up until now?
Can you tell me about the experience of having a preterm child?

Topic: Future priorities.

What is important for you and your child now?
What are your thoughts/ wishes for your child in the time to come?
Can you tell me how you picture that physical therapy can contribute to your everyday life in the time to come?

Appendix 6

Intervju guide fysioterapeut (norsk versjon)

Interview guide physical therapist (English version)

Intervju med fysioterapeut, generell intervjuguide.

Innledning:
Hva intervjuet skal handle om; fysioterapioppfølgingen for det aktuelle barnet med foreldre. Et viktig utgangspunkt for meg er at både barn, foreldre og fysioterapeuter er forskjellige – og har forskjellige måter å gjøre ting på, forskjellige behov. Det er ikke snakk om å finne frem til «rett eller galt», jeg ønsker å få høre om hvordan du opplever at fysioterapitilbudet fungerer for nettopp dette barnet og foreldrene.
Hvordan det foregår; fint om du vil fortelle fritt, være så åpen som du selv vil. En samtale oss imellom mer enn «spørsmål og svar».

Åpningsspørsmål: Kan du starte med å fortelle om dagens fysioterapitime, hvilke tanker har du omkring den?

Tema: dagens fysioterapibehandling.
Hva ønsket du å oppnå i dagens behandling?
Er det noe du vil trekke frem som spesielt vellykket i dagens behandling?
Var det noe du ikke synes du lyktes med i behandlingssituasjonen?
Kan du fortelle hvordan du synes samspillet mellom deg-barn-foreldre fungerte i dag?
Hva tenker du var det viktigste som barnet/ foreldrene fikk med seg ut av dagens time?
Noen konkrete episoder jeg vil trekke frem?

Tema: hvordan er det å jobbe med barnet?
Hvordan vil du beskrive barnet?
Kan du si noe om hva du som fysioterapeut tenker om barnet/ barnets utvikling?
Hvordan opplever du at samspillet med barnet fungerer?
Har du noen gode eksempler på hva barnet liker?
Kan du si noe om hva får barnet engasjert i behandlingene?

Tema: hvordan fungerer fysioterapien?
Hva er du opptatt av i din oppfølging av barnet/ foreldrene?
Kan du fortelle om hvordan en typisk fysioterapitime forløper?
Hva tenker du at fysioterapi kan bidra med for dette barnet/ foreldrene?
Har du noen tanker om hva som er målet med fysioterapioppfølgingen for dette barnet/ foreldrene?
Har du et eksempel på en god opplevelse fra fysioterapitimer med barnet som du kan trekke frem?
Er det noe ved oppfølgingen av dette barnet/ foreldrene som du synes er utfordrende/ uroer deg?
Hvordan opplever du at samspillet mellom barnet-foreldrene-deg fungerer i behandlingssituasjonene?
Hvilke tanker har du om foreldrenes rolle i behandlingen?
Hvordan opplever du at samarbeidet mellom deg og fysioterapeut på sykehuset fungerer?

Tema: veiledning/ ivaretakelse av foreldrene.
Hvordan synes du samarbeidet med foreldrene fungerer?
Har du noen tanker om hva disse foreldrene har behov for at du som fysioterapeut bidrar med inn i deres hverdag?
Kan du si noe om hvilke tanker du har omkring det å veilede foreldre?
Har du et godt eksempel der du synes du har lyktes med å lære foreldrene hvordan de best kan håndtere/ stimulere barnet?
Kan du si noe om ting som har vært utfordrende når det gjelder veiledning/ oppfølging av foreldrene?

Tema: hvem er du som fysioterapeut?
Kan du fortelle meg om din bakgrunn som fysioterapeut?
Hvilken kjennskap/ erfaring har du til det å jobbe med for tidlig fødte barn?
Kan du fortelle meg om hva du er opptatt av som fysioterapeut, hva står sentralt for deg i din jobb?

Interview with physical therapist, general guide.

Introduction:

What this interview is about; physical therapy service for this particular child and parents. It is important to me that both children, you as parents and the PTs are different – and have different ways to do things, have different needs. I am not searching for "right or wrong", but I want to hear about your perceptions of physical therapy for this particular child and parents.

How the interview proceeds; you are welcome to speak freely, be as open about things as you feel comfortable with. It is more like a conversation than "questions and answers".

Opening question: Could you start by telling me about today's session, what are your thought about it?

Topic: Today's session.

What did you want to achieve in today's treatment session?
Is there something you feel went particularly well in today's session?
Was there anything you feel you did not succeed with?
Can you tell me how you perceive of the interactions between you-child-parents today?
What do you feel was the most important thing that the child/ parents could take home from today's session?
Anything I (=researcher) want to point out?

Topic: Impressions of the child

How would you describe the child?
What are your thought on the child/ the child's development?
How do you perceive of your interactions with the child?
Do you have good examples of what the child likes to do?
Can you tell me what engages this child during treatment sessions?

Topic: Physiotherapy with the child

What do you think is important in the follow-up of this child/ parents?
Can you tell me how a physical therapy session typically proceeds?
What do you think are the contributions of physical therapy for this child/ parents?
Do you have any thoughts on the goal for your follow-up for this child/ parents? Har
Can you give an example of a good experience from physical therapy sessions with this child?
Is there something about the follow-up of this child/ parents that you find challenging/ makes you worried?
How do you perceive of the interactions between the child-parents-yourself during treatment sessions?
What are your thoughts on the parents' role during treatment?
How do you perceive of the collaboration between yourself and the hospital PT?

Topic: Collaboration with the parents

How do you perceive of your collaboration with the parents?
Do you have any thoughts on what these parents need for you do provide, which can contribute to their everyday life?
Can you tell me what your thoughts are when it comes to education of parents?
Do you have a good example in which you succeeded in teaching the parents how to handle/ stimulate their child?
Can you tell me about what you find challenging when it comes to educating/ supporting parents?

Topic: The PT's background

Can you tell me about your PT background?
What do you know/ how much experience do you have when it comes to working with preterm infants?
Can you tell me what you feel is important, what is pivotal to you in work as a PT?