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MINI REVIEW

Mother-Newborn Couplet Care from theory to practice to ensure zero separation for all newborns

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Abstract
With an increasing awareness of the importance of nurturing care and within a framework of Infant- and Family-Centred Developmental Care (IFCDC), zero separation, keeping parent and infant in continuous close physical and psychological proximity to each other, is key. In modern neonatology, high technological and pharmaceutical treatments are consistently integrated with caregiving considerations. Mother-Newborn Couplet Care is a concept of care where the dyad of the ill or prematurely born infant and the mother, needing medical care of her own, are cared for together, from the birth of the baby to its discharge. Mother-Newborn Couplet Care requires systems changes in both obstetrics and paediatrics considering planning and organisation of care, equipment and design of units. Accordingly, strong leadership setting clear goals and changing the professional mindset by providing targeted education and training is crucial to ensure the warranted high quality of care of all mother-baby dyads.

KEYWORDS
infant- and family-centred developmental care, mother-baby dyad, Mother-Newborn Couplet Care, neonatal care, obstetric care, staff training, systems change, zero separation

1 | INTRODUCTION

1.1 | Zero separation, an emerging paradigm for all newborns

> There is no such thing as a baby, there is a baby and someone
>
> (D. Winnicott)

Winnicott, a paediatrician and child psychoanalyst, made this famous statement of the nursing couple already in 1947.[1] In essence, he implied that the infant cannot exist outside of a relationship, and where there is a newborn baby, there is also maternal care. Although this is the natural condition for the human species, in the early twentieth century when birthing practice moved into hospitals, ward routines separated newborns from their mothers directly after birth. In time, the negative aspects of this change of practice became apparent and a desire emerged of returning to keeping mother and

Abbreviations: CPAP, Continuous Positive Airway Pressure; IFCDC, Infant- and Family Centred Developmental Care; MNCC, Mother-Newborn Couplet Care; NICU, Neonatal Intensive Care Unit; RCT, Randomized Controlled Trial; UN, United Nations; WHO, World Health Organization.

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newborn in close proximity to each other, for example rooming-in. Avoiding separation of the infant from the mother at birth, and engaging the parents as primary caregivers from the very start is of upmost importance. Although this has become clear over the years, separation is still the norm when the infant is born ill or preterm. Thus, it is crucial for medical units caring for ill or preterm newborn infants to organise and plan the care of both mothers and infants in a way that minimises separation—with the goal of *zero separation for all newborns*—a concept comprehensively described in a recent review by Bergman.[2] (Figure 1).

1.2 | Nurturing care of the newborn

Nurturing care is a recent concept suggesting that parents, caregivers and families need to be supported in providing sensitive care and protection in order for young children to achieve their developmental potential.[3] In short, what we do matters, but how we do it matters more. *The Nurturing care framework*[4] calls for support to begin already in pregnancy and the thematic brief on *Nurturing care for every newborn*[5] provides operational details, highlighting sensitive caregiving for small, ill or preterm infants from birth throughout childhood.

The development of the newborn brain is governed to a large extent by sensory input, negative experiences can affect the development of both anatomy and function of the brain, impose a negative influence on the individual's stress regulation and consequently, in a long-term perspective negatively impact future health.[6,7]

This is of special significance when the infant is ill or born prematurely. Medical care and daily caregiving of the infant inevitably involves repeated stressful and painful procedures interfering with its physiology, interrupting developmentally important moments of rest and sleep and the processing of biologically expected experiences—experiences that typically come from interaction with the parents and during the first days, primarily the mother.[2,8–12]

The psychological bonding of the parents to the infant, the infant's attachment to the parents and subsequently their capability to adequately interact with each other are of equal importance for future health and well-being of both infants and parents.[13] These delicate and sensitive psychological processes start already during pregnancy and may be interrupted by the premature birth or the unexpected illness of an infant. Behavioural cues of prematurely born or ill term infants are weaker and often more difficult to interpret and adequately respond to, which complicates bonding and attachment, as do crisis reactions of parents and unnatural separations of parents and newborns that occur as infants are admitted to traditional neonatal units.[14,15] Important research by pioneers such as Klaus & Kennel[16] has also recognised the first postpartum days as a unique and sensitive period laying the foundation for the mother-infant relationship—bonding and attachment.

Non-separation of infant and parents also has ethical and legal support in the UN Convention on the Rights of the Child from 1989.[17]

Key notes

- Zero separation should be provided for all newborns—healthy, ill or preterm—and their parents from delivery to discharge
- The care of an ill or prematurely born infant is coupled with the postpartum and medical care of the newly delivered mother in the same ward
- It is essential with systems change in planning and organisation of care, facilities and design of units as well as special education and training of staff for new competences and change of mindset

1.3 | Infant- and Family-Centred Developmental Care—IFCDC

The concept of Infant- and Family-Centred Developmental Care (IFCDC) has developed to address the issues described above.[18] IFCDC is a descriptive term for a framework of systems change in newborn care. With adaptations of hospital systems and care practices, it aims to increase well-being of infants and parents, optimise calmness and healthy sleep, reduce stress and pain, support parent-infant co-regulation, promote parental presence and support bonding and attachment, decrease strain on parents; and by all the above, improve brain development[7] and positively affect long-term child development.[19] Within such a framework, keeping parent and infant in close proximity to each other from birth is key. Mother-Newborn Couplet Care is a crucial component of needed systems change in order to equitably provide IFCDC and nurturing care to all newborns directly after birth.

2 | MOTHER-NEWBORN COUPLET CARE

Mother-Newborn Couplet Care is a concept where the care of the ill or prematurely born infant is provided, coupled with the care of the newly delivered mother in the same ward and uninterrupted from the birth of the child to discharge. The maternal care includes not only postpartum care, but also medical care for mothers with more complex medical needs such as caesarean section, pre-eclampsia, hypertension, infections diabetes. (Figure 2).

Many mothers to infants born ill or prematurely have extended need of medical care and would otherwise be separated from their infants during the often most critical medical period for their infant, and the very important first days of bonding and attachment.

2.1 | Organisation and collaboration between the obstetrical and paediatric departments

Close collaboration between the obstetrical and the paediatric or neonatal departments is vital when organising Mother-Newborn

FIGURE 1 Zero separation and Mother-Newborn Couplet Care in delivery room for an unstable preterm infant with neonatal thyrotoxicosis in need of respiratory support. Note the intact family triad

FIGURE 2 Zero separation and Mother-Newborn Couplet Care in the NICU for a family with very preterm twins on CPAP for respiratory distress and iv-treatment for hypoglycaemia. Note mother's iv therapy, the cup for early milk expression, skin-to-skin contact also for the second twin with the father and the visual connection between the parents

Couplet Care. Support from Hospital management is important, since financial investments might be needed. Staff attitudes and professional approach lay the foundation for being able to care for newborns and their mothers as a unity, a dyad. This can only be reached with a strong and firm leadership and a clear goal for staff in both departments.

It is easier to achieve needed systems change in hospitals with integrated obstetrics and neonatology in a common department of perinatology as well as in smaller units with flexible organisations. Mother-Newborn Couplet Care should be adjusted to the local context and can be structured in different ways.

For infants in need of specialised care, Mother-Newborn Couplet Care of the infant and the mother is most often provided in the neonatal unit. However, it might as well be in a paediatric cardiac, surgical or intensive care unit—depending on the organisational structure of the hospital and the condition of the infant. On the other hand, Mother-Newborn Couplet Care can also be provided in the maternity unit when the infant has only minor conditions.

Clinical care of both the infant and the mother by one primary care team can be thought of as the gold standard of Mother-Newborn Couplet Care, achieving the best possible continuity when caring for the dyad. The nursing teams have to be competent in caring for both patients. In many countries, nurses are scarce and nurses with extraordinary competencies like this, being comfortable in caring for an ill or prematurely born newborn as well as the newly delivered mother, are rare to find.

An alternative solution is to collaborate within an existing structure of separate obstetric and neonatal departments. Care is still provided for the mother and the infant, physically in the same unit. However, maternity nurses from the obstetric department care for the mother and neonatal nurses care for the infant. The thought of a primary care team for the dyad is lost in favour for a system that is possibly more feasible to implement.

2.2 | Mother-Newborn Couplet Care in clinical practice

Mother-Newborn Couplet Care starts as soon as the infant is born. To be able to keep the infant and the mother together from the start, the neonatal team has to start the care of the premature or ill newborn at the mother's bedside, in the delivery room or operating theatre. Depending on gestational age and medical condition of the infant, different caregiving is needed, most of which is possible to plan for without separating the infant from the mother. For the neonatal team to care for the newborn at the mother's bedside, the delivery room needs to be spacious and all needed equipment have to be readily available and preferably prepared well in advance—the more complex the expected situation, the more preparation is required. Close collaboration and communication are needed between the team assisting the delivery and the team caring for the newborn.

Infants in need of specialised neonatal care are stabilised, and continued care is planned for, again in close collaboration and communication with the obstetrical team. If possible, transfer to the neonatal unit is postponed until the mother is judged to be safely moved from the delivery ward, together with her infant. Many infants can be transferred in a skin-to-skin position with the mother, or if that is not possible, with the father or partner. Specifically made transport equipment for transfer of infants in an uninterrupted skin-to-skin-position with a parent has been developed in many units.

The postpartum care of the mother continues in the neonatal unit under the responsibility and close supervision of staff from the department of obstetrics. To guarantee patient safety, it is important that the neonatal and maternity units appropriately adjust the design and structure of the unit and implement guidelines and checklists for both infant and mother.

2.2.1 | Maternal eligibility criteria for Mother-Newborn Couplet Care

Most mothers are eligible for Mother-Newborn Couplet Care in the unit their infant is being cared for, only a few hours after giving birth. The obstetrician needs to assess the appropriate level of care for the newly delivered woman and have trust in the system of this model of care. However, some women still need to be cared for at the adult intensive care unit for conditions like eclampsia and severe pre-eclampsia, large bleeding or haemodynamic instability for a period of time, before they safely can be reunited with their infant in the neonatal unit. Other conditions that may hinder Mother-Newborn Couplet Care for the mother are severe contagious disease or severe psychiatric illness.

Guidelines often recommend continuous observation of a newly delivered woman during the first 1–2 h. In a flexible system, even this thorough initial observation of the woman can be performed in the neonatal unit if the infant is in a critical condition that requires immediate transfer.

In the neonatal unit, doctors and nurses from the obstetric department continue to have the medical responsibility for the mother, including postpartum caregiving, medical rounds, prescriptions and monitoring of medications.

When the mother is fully recovered, she is discharged from obstetric care, but continuous to stay with her infant in the neonatal unit during its entire hospital stay.

2.2.2 | Infant eligibility criteria for care in the maternity ward

For infants with limited need of special care, Mother-Newborn Couplet Care can be planned for in the obstetric department, or other medical or surgical departments, together with the mother. Typically, infants cared for at the maternity ward have mild and transient medical conditions in need of extra care or observations. This might be infants born late preterm, having mild hypoglycaemia, feeding difficulties, being in need of phototherapy for uncomplicated neonatal jaundice or observation for mild transient tachypnoea, or having risk factors for neonatal infection.

Criteria that can be used might be cardio-respiratory stability, temperature stability, feeding by mouth, being above 34 full weeks or having a weight above 1800 grams. Guidelines and checklists are needed, but may vary between hospitals.

Whenever an infant in need of special care is in the maternal ward, the paediatric team need to be responsible, assess the medical situation and do medical rounds and examinations. This is often easy to implement since there is already an organisation for healthy newborns, who nowadays always stay with their mothers at the maternity ward until they are discharged together.

2.2.3 | Adequate training of the medical and nursing staff

To gain the necessary competencies to care for both the mother in the postpartum period and the infant with medical needs, substantial education and training is required by staff. Although the Mother-Newborn Couplet Care model of care often requires a clear division between the obstetric and neonatal departments in terms of responsibilities when caring for the two patients, a cross-over in terms of knowledge will be needed among staff who will be working together in the best interest of the dyad. Development of education plans and curriculum is vital both when planning for and implementing Mother-Newborn Couplet Care, as well as in offering continuous education for new staff. This can involve education and training in early bonding and attachment processes and how to support early skin-to-skin contact, breastfeeding and caregiving skills, as well as maternal or paediatric emergency situations and other hands-on training and practical skills that might be needed. For example, when the mother is cared for in the neonatal unit by staff from the obstetric

TABLE 1 Important design & equipment issues specific for Mother-Newborn Couplet Care when implemented in the neonatal unit

Equipment, supplies and storage of medicine for treating the mother.
Specific surveillance and alarm system for the mother
Well-equipped movable emergency cart for treating unexpected maternal emergencies
Enough space around the infant and mother's care space for individual bed for mother (preferably also for father/partner) and wide doorways enabling safe and rapid transfer of the mother to the operating theatre or adult intensive care unit if needed
Maternal beds should be ordinary hospital beds that are comfortable and adjustable for breastfeeding but also on wheels, enabling safe and rapid transfer—for added flexibility, provide adult hospital and interchangeable beds for both parents
Bath/shower rooms en suite or adjacent to the family room big enough and equipped for mothers that need assistance.

department, all neonatal staff will still need basic knowledge of, and practical skills in handling, postpartum medical complications such as haemorrhages, seizures and signs of acute infections. Postpartum skills may, or may not, be part of the core programme curriculum required for licensure for nurses in a country; however, the majority of nurses working in the neonatal unit may not have practiced in this area before. Likewise, when the infants medical condition permits Mother-Newborn Couplet Care to be provided in the obstetric department, new knowledge and skills might be needed by the maternity nurse, enabling an integrated and seamless care for the dyad. The local context will need to determine the educational plan needed for successful Mother-Newborn Couplet Care. Further, when planning for Mother-Newborn Couplet Care, mock-ups and simulations have been reported as a good way to engage staff, raise awareness and elicit important feedback to make improvements to ensure optimal care of the dyad and family.[20] With increased knowledge and training follows a heightened understanding of the needs of both the mother and the infant forming the dyad. This awareness is ultimately very rewarding, not only for the patients, but also for the staff providing Mother-Newborn Couplet Care.

2.3 | Unit design with focus on maternal care and safety

In addition to systems change in the organisation of care practices and in training and education, substantial adjustments of the design of the units are needed to ensure effective and safe Mother-Newborn Couplet Care. The units involved must not only provide facilities enabling mother and partner to stay with their baby throughout 24 h but also provide safe care for both patients. When providing Mother-Newborn Couplet Care in a neonatal or paediatric unit, specific challenges arise to ensure safe care for the newly delivered mother with sometimes complex medical conditions. Both the American NICU Design Standards and the European Standards of Care for Newborn Health for NICU Design provide comprehensive and detailed design recommendations.[21,22]

The mother and the baby are not only cared for in the same ward, they should, if possible, be cared for within a shared space, having their bed and cot/warmer/incubator in close proximity to each other. If this cannot be provided by a single room, arrangements could be made to increase the privacy around a shared bed space, for example with screens.

Equipment for emergency situations for newly delivered women is essential (Table 1). Obstetricians and maternity nurses have to be easily reached by phone or direct call, or by alarm systems and readily available for potentially rapid deterioration of a woman's medical condition.

2.4 | The Swedish experience of Mother-Newborn Couplet Care

The development of Mother-Newborn Couplet Care began in Sweden in the late 1990s. It started in smaller district hospitals but has gradually been more widely implemented also in the larger academic centres. However, currently approximately only one third of the Swedish neonatal units provide this model of care. From an international perspective, the interest is rapidly growing, but Mother-Newborn Couplet Care has been implemented in a relatively small portion of hospitals despite adopted by international standards.[22,23] This gradual development is reflected in, and probably dependent of, the lack of solid scientific evidence on the specific effect of Mother-Newborn Couplet Care on infant, mother and health economics. Another reason of slow progress in implementation is the required systems change. This is always challenging and even more so when engaging separate departments of a hospital. Accordingly, strong leadership setting clear goals and promoting change in the professional attitudes and mindset is crucial.

There are not many structured or randomised studies on zero separation. The Stockholm Neonatal Family Centered Care Study was a relatively large two-site RCT on preterm infants that reported reduced infant pulmonary morbidity and significant reduction of length of stay at the hospital, thus cost saving.[24] It was essentially a study on zero separation with 24/7 parental presence in the intervention group by providing single family rooms. Even if one of the two sites also provided Mother-Newborn Couplet Care, the numbers were too small to discern any statistically significant benefits for this model. Even so, at this site, the experience of Mother-Newborn Couplet Care was very positive. The staff was convinced and reported rewarding working conditions. Even more important, the parents were very positive—especially evident with the families that had previous experiences of a more traditional family-centred care unit with older siblings.

After many years of clinical practice, we have experienced positive effects for mothers regarding early breastmilk production, faster recovery with lower blood pressure for women with

pre-eclampsia and less reported pain. Parents appear calmer and more confident and bond earlier to their infants. Parents are also appreciated as the most important persons in the baby's life from the very start, including more readily taking on the role as primary caregivers for their baby.

3 | FROM HERE AND BEYOND

Advanced technical and pharmaceutical treatments have dramatically increased the chances for survival of very ill or immature infants in high-resource settings. The importance of caregiving models has also been highlighted by a recent large multi-centre WHO trial in middle- and low-income countries, studying the effect of Mother-Newborn Couplet Care in combination with immediate skin-to-skin contact in very small and unstable babies. It demonstrated a reduction of neonatal mortality by 25%,[25] and accordingly, WHO plans to revise its recommendations.[26] Furthermore, there is an increased acknowledgement of humane and developmentally supportive care.[18] To provide the best possible conditions for the development of ill or prematurely born infants and their families, we need to offer caregiving based on sensitive interactions, attuned to infant behaviour and needs, and to the delicate processes of bonding and attachment. To guarantee all these components of optimal and high-quality care for every family, it is time for a widely implemented systems change that enables zero separation from birth and Mother-Newborn Couplet Care for all.

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CONFLICT OF INTEREST

None.

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