**Topic Expert Group:** Infant- and family-centred developmental care

**Very early and continuous skin-to-skin contact**

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**Target group**
Newborn infants and parents

**User group**
Healthcare professionals, neonatal units, hospitals, and health services

**Statement of standard**
Skin-to-skin contact between mother or father and newborn infant is initiated as early as possible and maintained continuously.

**Rationale**
Skin-to-skin contact (SSC) supports infant physiology and transition to extra-uterine life and clinical stabilisation. (1–3) It acts through multimodal mother-infant sensory interaction and offers an environment that elicits hormonal and epigenetic processes, also supporting the initiation of breastfeeding. On the other hand, separation of the mother and infant after birth may induce harmful stress hormone responses that potentially leads to poorer resilience through the lifespan. (4) To minimise mother-infant separation and safely provide SSC, healthcare professionals have to acquire specific competence and skills to ensure protection of patent airways and provision of medical treatment and technical support as clinically indicated.

Early SSC provides the opportunity for early bonding between the infant and a safe and supportive parent figure. There is biological evidence indicating that the moment of birth is an early critical period. Consequently, early SSC is of particular importance for very preterm infants considering their recognised challenges in establishing future secure attachment. Mother-infant separation disrupts sleep architecture (5), whereas SSC promotes sleep cycling, necessary for the developing brain. (6) Early and continuous SSC is very important for successful breastfeeding and there are indications that continuous SSC has positive effects on long-term outcome. (1)

**Benefits**

**Short-term benefits**
- Improved physiological transition to extra-uterine life (3,7)
- Improved early physiological stability in preterm infants (1,2)
- Increased breastfeeding rates (2)
- Improved growth (1)
- Improved sleep (6,8)
- Facilitated parental sensitisation to their infant’s needs and cues (9)
- Improved maternal empowerment and self-efficacy (10)
- Improved paternal empowerment and self-efficacy (consensus)
**Long-term benefits**

- Increased breastfeeding rates beyond infant period (1,2)
- Improved parent-infant bonding and mental health (11)
- Improved immunity, decreased re-admissions (12)
- Reduced prematurity related morbidity in adulthood (13)
- Improved neurodevelopmental outcome (14)
- Improved social behaviour in early adulthood (15)
- Reduced stress for parents (16)
- Improved maternal outcomes associated with breastfeeding (17)

**Components of the standard**

<table>
<thead>
<tr>
<th>Component</th>
<th>Grading of evidence</th>
<th>Indicator of meeting the standard</th>
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<tbody>
<tr>
<td>For parents and family</td>
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<tr>
<td>1. Parents are informed by healthcare professionals before birth about the importance and provision of postnatal safe skin-to-skin contact (SSC).</td>
<td>A (Low quality) B (High quality)</td>
<td>Patient information sheet</td>
</tr>
<tr>
<td>2. Maternal SSC is provided as early and as continuously as possible. (3,7)</td>
<td>A (High quality) B (Moderate quality)</td>
<td>Guideline, parent feedback</td>
</tr>
<tr>
<td>3. The father is involved to ensure continuous SSC when the mother is not able to do so. (18)</td>
<td>A (Moderate quality) B (Moderate quality)</td>
<td>Guideline, parent feedback</td>
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<td>For healthcare professionals</td>
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<td>4. A unit guideline on SSC and early sucking is adhered to by all healthcare professionals. (2,19) (see TEG Care procedures)</td>
<td>A (High quality) B (High quality)</td>
<td>Guideline</td>
</tr>
<tr>
<td>5. Training on safe SSC technique, including the protection of the airway, SSC transport from labour and operating rooms, early sucking and breastfeeding is attended by all responsible healthcare professionals. (18,20)</td>
<td>A (Moderate quality) B (High quality)</td>
<td>Training documentation</td>
</tr>
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<td>For neonatal unit</td>
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<tr>
<td>6. A unit guideline on SSC and early sucking is available and regularly updated. (2,19)</td>
<td>A (High quality) B (High quality)</td>
<td>Guideline</td>
</tr>
<tr>
<td>7. NICU bed space and practical arrangements for SSC throughout the 24 hours by mother and father are</td>
<td>A (Low quality) B (Moderate quality)</td>
<td>Audit report</td>
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Where to go – further development of care

<table>
<thead>
<tr>
<th>Further development</th>
<th>Grading of evidence</th>
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<tbody>
<tr>
<td>For parents and family</td>
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<tr>
<td>N/A</td>
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<tr>
<td>For healthcare professionals</td>
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<td>N/A</td>
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<td>For neonatal unit</td>
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<tr>
<td>Develop strategies for the use of skin-to-skin contact during intra- and inter-hospital transport.</td>
<td>A (Low quality)</td>
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<td>For hospital</td>
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<td>N/A</td>
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<tr>
<td>For health service</td>
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<td>N/A</td>
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</table>

Getting started

Initial steps

For parents and family

- Parents are verbally informed by healthcare professionals about the importance of early skin-to-skin contact (SSC).

For healthcare professionals

Audit report, clinical records

Training documentation

Audit report

Guideline
- Attend training on safe SSC technique, including the protection of the airway, SSC transport from labour and operating rooms, early suckling and breastfeeding.
- Encourage parents to start SSC as soon as possible.
- Take incremental steps to care for smaller and more fragile newborn infants.

**For neonatal unit and hospital**
- Develop and implement a unit guideline on SSC including safe technique to secure the airway during transport from the incubator to the mother.
- Develop information material on early SSC for parents.
- Provide adjustable reclining chairs for parents in NICU.
- Support healthcare professionals to participate in training on early SSC.

**For health service**
- Develop and implement a national guideline on SSC including safe technique to secure the airway during transport from the incubator to the mother.

**Description**

The benefits of skin-to-skin contact (SSC) derive from a global neurological state, in which intimate maternal-infant physical SSC is the safe and expected environment to foster reproductive fitness. (24) The immediate result is bonding, which is in the short-term expressed physiologically (25), with improved cardiorespiratory and metabolic status. (2) This same bonding is however also the psychobiological root of long-term emotional and social development. (25,26) This is the essence of “buffering protection of adult support”, and absence thereof corresponds to “toxic stress” in the context of early childhood development. (27) The many benefits of SSC are really reflecting the decrease of harms from toxic stress that follows separation.

Recent advances in the understanding of epigenetics and developmental neuroscience (28), along with interpretations from life sciences theory (evolutionary biology) (24,29) and preclinical studies (30), suggest new paradigms for improving neonatal outcomes, and by gentle early newborn care based on parents they suggesting increased attention to the needs of the developing brain, as a basis for better long-term outcomes. (2,31–33) Moreover, a feature of reproduction in primate life sciences theory is SSC, where SSC is the environment or habitat required for epigenetic and neurosensory needs (34), supporting physiological systems for survival. (25) Maternal-neonate separation in primate studies is the most severe form of stress known (35,36), resulting in physiological dysregulation (25), overwhelming autonomic and neuroendocrine stress-responses (37), with the most severe effects on development and health. (38–40) Decreased resilience is proportional to immaturity, therefore the smaller the infant the greater the potential benefit of SSC. Further it is during the period of transition to extra-uterine life immediately after birth that such regulation has the greatest importance (7), and when failure may result in mortality in low resource settings. (1,18,41)

Several mechanisms may underlie SSC, at the heart of these is the concept of maternal-neonate co-regulation, meaning that mother and neonate in close contact constitute an evolved self-regulating system which, when functioning properly, promotes mutual health and thriving. (25,42–46) This system requires a sense of safety (47) provided by SSC. This self-regulating system comprises ‘hidden regulators’ – physiological, behavioural and psychological signals passed back and forth between mother and infant – that regulate physiology, mood and behaviour
towards thriving. (25,45) Regulatory effects of maternal odour (45,48), breastmilk (49) and SSC (50) on human neonatal physiology, breastfeeding, sleep and brain development have been demonstrated. Sleep may be the most powerful factor, as brain development takes place primarily during hourly sleep cycles. (6) Separated infants have disturbed sleep cycles (5), while SSC in infants born preterm promotes sleep cycling (51), and consequently accelerates brain maturation. (8) Similarly, these systems regulate feeding behaviour, and offer frequent opportunities to suckle at the breast, with an umbrella of sensory cues from SSC and promote early establishment of exclusive breastfeeding. (2) Improved temperature control from SSC is achieved, fewer calories are required for thermogenesis and more are available for growth. For stable low birth weight infants, there is good evidence that SSC improves both mortality and morbidity. (1)

Animal and human evidence shows that the regulatory status of physiological systems in early life may become epigenetically programmed for life (13,52–54) and increased risk for long term physiological dysregulation and social maladaptation. (38) This permanent anatomical and physiological embedding is called developmental programming. (53,54) A ten-year follow-up study from Israel provides evidence of a long-lasting benefit from early SSC in both physiologic organisation and in cognitive control. (14) The ‘hidden regulators’ may be involved in establishing a number of biological rhythms (brain oscillators), that control the social vagus (parasympathetic), cortisol reactivity (sympathetic) and the sleep-wake cycle (state organisation). (55) The early settings of these may contribute to an ongoing advantage in development, ensuring a more secure maternal-infant attachment, with increasing benefit over time. (14)

Newborn infants, through their behaviour, vocalisations (56), and odours (48) also exert powerful regulatory influences over mothers and fathers. These regulatory mechanisms are reflected in the response patterns of hormones, e.g. oxytocin (57), testosterone, prolactin, and brain activity in mothers (26), and fathers. (57,58) SSC is important for fathers and their involvement enables continuous SSC. (59–61) Other close family members may also contribute. (62)

Attention to SSC technique is important. Key features are ensuring actual skin contact with no other clothing at all between infant and adult skin, and ensuring that the airway is secured and protected. There is no technology that contra-indicates the use of SSC, however a skill set is needed that ensures patient safety is protected at all times.

Source


27. Shonkoff JP, Garner AS, Committee on Psychosocial Aspects of Child and Family Health; Committee on Early Childhood, Adoption, and Dependent Care; Section on Developmental and Behavioral Pediatrics, Siegel BS, Dobbins MI, Earls MF, et al. The Lifelong Effects of Early Childhood Adversity and Toxic Stress. PEDIATRICS. 2012 Jan 1;129(1):e232–46.


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