

Fragile Infant Forums for Implementation of IFCDC Standards: Skin-to-skin Contact with Intimate Family Members

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Introduction

After more than five years of work by an inter-professional group of neonatal experts, “Standards, Competencies, and Best Practices for Infant and Family-Centered Developmental Care in the Intensive Care Unit” was published in 2020 as a supplement to the *Journal of Perinatology*(1). In this publication (also posted online at <https://nicudesign.nd.edu/nicu-care-standards/>), the specific areas addressed included: 1) Systems thinking in complex adaptive systems, 2) Positioning and touch for the newborn, 3) Sleep and arousal interventions for the newborn, 4) Skin-to-skin contact with intimate family members, 5) Reducing and managing pain and stress in newborns and families, and 6) Management of feeding, eating and nutrition delivery. This article will focus on the standards, competencies, and best practices for “Skin-to-skin contact with intimate family members.”

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Skin-to-skin contact (SSC) in neonatal or pediatric intensive care (also known as skin-to-skin care or Kangaroo Care) is unique in that each of the other topics included in the standards is addressed in some way when implementing SSC, positioning and touch; sleep and arousal interventions; reducing and managing pain and stress; and feeding, eating, and nutritional delivery. SSC, therefore, can be considered to incorporate many evidence-based approaches in one effective multimodal intervention for babies and parents. Perhaps even more importantly, SSC can be a key factor in forming emotional connections between parents and their babies in intensive care, thus contributing to parent-infant bonding and attachment with lifelong effects for babies, parents, and families.

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In “Standards, Competencies, and Best Practices for Infant and Family-Centered Developmental Care in the Intensive Care Unit,” (1) the term “standard” refers to a safe, evidence-based expectation, or measure, of best practice. The term “competency” refers to the action, or sequence of actions, that results in the standard’s performance. Four standards are presented for “Skin-to-Skin Contact with Intimate Family Members,” each with several competencies to reach that standard. Each standard includes a section describing the evidence-based rationale for its role in Infant and Family-Centered Developmental Care (IFCDC).

Standard 1 for Skin-to-Skin Contact

Parents shall be encouraged and supported in early, frequent, and prolonged skin-to-skin contact (SSC) with their babies.

- Competency 1.1: Verbal and written information about the benefits of SSC shall be provided to parents (including fathers/partners) in their primary language whenever possible and as early as possible before or after intensive care unit (ICU) admission.
- Competency 1.2: Information in a variety of appropriate formats and the parents’ language should be provided about the SSC policy and how it applies specifically to them and their baby, including a) inclusion and exclusion criteria; b)

indications and techniques for kangaroo care (KC) and hand containment (HC); and c) who may be designated by parents to participate in SSC.

- Competency 1.3: Images of individuals from diverse populations doing KC and HC should be placed in prominent hospital and ICU locations.
- Competency 1.4: Parents should be given opportunities to practice SSC transfer with an appropriately sized manikin, if desired, before transferring their baby.
- Competency 1.5: Parents should be provided with comfort, including a) safe and comfortable seating or reclining accommodations that are readily available at baby's bedside; b) support pillows; c) secure wraps to support baby; d) a mirror to see baby's face; e) hydration and nutrition for parents as needed; f) privacy, if desired (in private rooms or by privacy screens); and g) a quiet, therapeutic environment for being with their baby.
- Competency 1.6: A healing environment that protects the baby's physiologic and behavioral stability shall be maintained during SSC including a) appropriate room temperature with absence of drafts; b) consistently low sound levels; c) avoidance of bright lights with individualized light as needed to assess baby; d) prominence of parent's scent (free of strong scents including perfumes and tobacco); e) proximity to mother's breast to support smell and taste (when a mother providing milk is holding her baby); and f) gentle touch and handling to protect baby's immature vestibular system.
- Competency 1.7: Parents shall be supported in recognizing their baby's behavioral communications of stress and relaxation during SSC.
- Competency 1.8: Parents shall be encouraged to support their baby in SSC during painful procedures whenever possible.
- Competency 1.9: Parents shall be encouraged to have vocal and singing interactions with their baby during SSC to enhance parental-infant connections, reduce parental anxiety, increase newborn vocal/listening interactions, and improve the baby's autonomic stability.
- Competency 1.10: Parents should be allowed to fall asleep during SSC or Kangaroo Care (KC) when safety measures are in place that include: a) parent and baby are in a non-rocking, reclining chair or bed; b) baby is well secured by an appropriate wrap to parent's chest; c) baby is electronically monitored if indicated; and d) an appropriate healthcare provider is immediately available.

“Parents need information to appreciate the therapeutic effects of SSC with their baby in the ICU and deserve information that is clear and understandable, free from medical jargon, and in their native language (2, 3).”

Evidence-Based Rationale for Standard 1:

- Parents need information to appreciate the therapeutic ef-

fects of SSC with their baby in the ICU and deserve information that is clear and understandable, free from medical jargon, and in their native language (2, 3). A pre-selected teaching DVD on SSC may be helpful for parents to watch before doing SSC for very premature or sick babies. Fathers often need specific encouragement to hold their baby in SSC and should be included in all educational efforts and SSC opportunities (4, 5). Parents need to see role models within their own culture and ethnicity doing KC and HC (6, 7).

“Wraps to secure babies in the KC position have been shown to provide comfort and safety and encourage more SSC (17).”

- Parents should be encouraged to have early, frequent, and prolonged SSC with their baby whenever possible. Parents are often intimidated by the ICU environment and their baby's size and medical condition and may need reassurance, support, and encouragement to engage with their baby in the ICU (8, 9). SSC/KC has been shown to reduce maternal anxiety in the NICU (10). Parents may need instructions on developmentally appropriate HC and may wish to practice a simulation of KC with a manikin before doing it with their baby. Supporting parents in recognizing their baby's behaviors and communicating stress and relaxation helps reduce maternal stress (11). Supporting parents in having SSC with their baby reinforces their role as a parent and as an active member of the caregiving team (12). Many parents want to be involved in comforting their baby during painful procedures and should understand how and why SSC can allow them to do so (13-15).
- Safety and comfort are essential if frequent and prolonged SSC is to be achieved (16). Comfortable seating or reclining accommodations, including adult beds or reclining chairs whenever possible (non-rocking for intubated babies), should facilitate SSC whenever parents are present. Mothers may need extra support to be comfortable for days/weeks after giving birth. Wraps to secure babies in the KC position have been shown to provide comfort and safety and encourage more SSC (17). Breastfeeding mothers need hydration and nutrition regularly. Babies being electronically monitored should continue monitoring during KC and be visually monitored by a healthcare provider when the parent is asleep during SSC.
- Many mothers (and sometimes fathers) desire privacy during transfer when their chest is exposed and during SSC for enhanced bonding with their baby. Parents often need support in just being a parent and understanding that their baby's behavioral communications can help create an emotional connection with their baby in the ICU (18, 19). Because it is sometimes difficult to see a baby's face during KC, a mirror can provide another means for parents to connect with their baby. Utilizing Kangaroo Supported Diagonal Flexion (KSDF), the positioning provides more opportunities for mother-baby eye-to-eye contact, maternal vocalizations, smiles, and caressing (20). Parental talking and singing during SSC can reduce anxiety and improve autonomic stability in stable preterm babies (21). Babies born prematurely, who spend their first weeks and even months of life in the ICU, are often exposed to excessive sound levels. If separated from their mother, they are deprived of the maternal sounds they would otherwise hear in utero. Evidence suggests that

the functional development of the auditory system is largely influenced by environmental acoustic inputs early in life, and hearing m/other's voice enhances hearing development and physiological stability (22, 23).

- While thermal synchrony with the parent will usually keep the baby warm, some rooms have extreme temperatures that should be noted and accommodations made (24). SSC stimulates oxytocin and neuropeptide release, promoting localized vasodilation and increased skin temperature of the mother's breast tissue, thus promoting newborn thermoregulation. Loud sounds are destabilizing to premature and sick babies and can interrupt sleep (25). ICU staff conversations and monitor alarms are the primary sources of loud noise levels in the ICU. In addition, direct light can interfere with sleep, and strong scents can destabilize premature and sick babies (25). Babies recognize and prefer their mother's scent (26). Mother's milk's early smell and taste provide positive oral and gustatory experiences. It is important to recognize that all baby handling should be done slowly to avoid overstimulation of the baby's immature vestibular system (27, 28).
- Having a baby in the ICU is mentally, emotionally, and physically exhausting, and parents are usually chronically tired (29). If safety measures are in place, prolonged SSC in KC is a good intervention for both baby and parent to promote rest and sleep. In addition to secure positioning and electronic monitoring (if indicated), an appropriately trained healthcare provider must be immediately present whenever a parent is asleep during KC.

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Standard 2 for Skin-to-Skin Contact:

An interprofessional collaborative team will develop, implement, monitor, and evaluate education and policies supporting skin-to-skin contact between parents and their babies.

- Competency 2.1: A written policy and education/training plan for SSC shall be: a) known by all ICU interprofessional staff; b) reviewed by all new employees during employee orientation and annually; and c) evaluated every 1-3 years by ICU leadership for any needed updates.
- Competency 2.2: The SSC policy shall include: a) strategies for keeping the baby together with m/other as much as possible; b) clear inclusion and exclusion criteria for SSC; and c) who may be designated by parents to participate in SSC.
- Competency 2.3: The SSC staff education plan shall include didactic education about a) the developmental and physiologic expectation of all newborn babies to be in continuous SSC contact with their mothers after birth and the stress induced by separation; b) the multiple benefits of SSC for babies including decreased mortality, improved physiologic

stability, reduced stress and pain, optimal sleep, enhanced neurodevelopment, enhanced gut microbiome maturity, improved feeding tolerance, increased growth, early initiation and longer durations of breastfeeding, decreased rates of sepsis, enhanced parental-infant attachment and bonding; c) the benefits of SSC for parents including reduced stress and anxiety, enhanced parental-infant attachment and bonding, and increased breast milk production for mothers; and d) the need for a healing environment during SSC including protection from loud sounds, bright lights, and strong scents and practical ways to create and maintain such an environment. (30)

- Competency 2.4: SSC staff training should include simulation training with an appropriately sized baby manikin/doll on how to safely do standing and sitting transfers of babies (including babies on mechanical ventilation and with lines) to parents' chests.
- Competency 2.5: ICU staff who are experienced and comfortable with SSC transfers should be available to mentor less experienced staff until they gain competence and confidence in facilitating SSC transfers.
- Competency 2.6: SSC educational content should include ways to individualize SSC according to the baby's medical condition, behavior, and state organization and should include a) descriptions, techniques, and indications for KC or gentle supportive HC and b) techniques and scripts for supporting use of these options to parents.

“SSC is one of the most studied interventions in neonatal care. The benefits of SSC documented in numerous studies include: decreased mortality (36, 37), improved physiologic stability (38), reduced stress and pain (13-15), optimal sleep (39), enhanced neurodevelopment (33, 40, 41), enhanced gut microbiome maturity (42), improved feeding tolerance (43), increased growth (44, 45), early initiation and longer durations of breastfeeding (37, 46, 47), decreased rates of sepsis (36, 46), reduced parental stress and anxiety (14), and enhanced parental-infant attachment and bonding (14, 36, 41, 48-50).”

Evidence-Based Rationale for Standard 2:

- Formal policies legitimize care practices as standards of care and help to standardize practice methods (31). Policies fundamental to the unit's culture must be introduced early, during orientation, and after employment begins. An SSC policy should clearly describe the inclusion and exclusion criteria for SSC/KC and define who may participate in

SSC/KC to avoid ambiguity and confusion. Staff education should explain that maternal proximity is the developmental and physiological expectation of all newborn mammals and the “natural habitat” for all newborn altricial mammals (32). Education should include evidence in neuroscience and neurobiology that supports the importance of SSC on newborn brain development (33). Much research (animal and human) documents the universal stress reactions experienced by both mothers and babies when they are separated (34, 35). Therefore, barring extreme medical circumstances, every effort should be made to keep babies with mother as much as possible for optimal physiologic stability and neurodevelopment.

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- Since staff are responsible for creating and maintaining a healing environment in the ICU, they need information about the importance of individualizing light, sounds, and scents in ways that will protect babies in the ICU from developmentally inappropriate stimulation. In addition to knowledge of the rationale, staff need practical methods of applying this knowledge to support parents and babies during SSC. Staff need more than knowledge and theory to support SSC enthusiastically. Simulation training provides practical, hands-on experience during the learning process to develop competency and confidence in new skills. It can be done with appropriately sized baby/doll manikins to demonstrate how to safely perform standing and sitting transfers of babies (including intubated babies) to parents’ chests (53). Many studies have documented the safety of SSC/KC with ventilated babies (54, 55), and at least one prospective study with 263 VLBW babies has documented the safety of SSC with umbilical lines (56). A support team for day and night shifts can provide ongoing assistance with a new skill, often needed during the early stages of practice.

“All care, including SSC, should be provided in a manner individualized to the baby’s developmental stage and adapted to age, medical condition, stability, and state availability (27, 28). While KC is usually the first choice for SSC, parents should be encouraged to provide developmentally appropriate HC for their baby if it is contra-indicated.”

- All care, including SSC, should be provided in a manner individualized to the baby’s developmental stage and adapted to age, medical condition, stability, and state availability (27, 28). While KC is usually the first choice for SSC, parents should be encouraged to provide developmentally appropriate HC for their baby if it is contra-indicated. Providing KC or HC for a tiny, fragile baby can frighten parents, who may need reassurance and a demonstration of techniques.

Standard 3 for Skin-to-Skin Contact:

Babies shall be evaluated to a) determine their readiness for transfer to KC; b) assess stability during transfer from bed to parent’s chest; c) assess baby’s response to SSC (KC or HC); and d) assess their stability during and after transfer back to the bed.

- Competency 3.1: A standardized assessment of the baby’s readiness, stability, and response to transfer and SSC should be utilized by ICU staff.
- Competency 3.2: Electronic or manual documentation should be created, and staff should be trained in methods of entering data to record parameters, such as: a) if the baby was eligible for KC, b) if KC and/or HC was offered to parent; c) if KC or HC was done and how long; d) which parent had SSC with baby; e) baby’s response; f) parent’s experience; and g) staff experience/motivation.
- Competency 3.3: Periodic quality improvement (QI) evaluations should be conducted using validated methodology to evaluate SSC implementation and sustainability.

Evidence-Based Rationale for Standard 3:

- Standardized evaluation and documentation will aid in monitoring safety and therapeutic value in SSC. A variety of valid assessments for SSC are available (16). Accurate and consistent data collection will make evaluating progress and identifying quality improvement opportunities possible. Without formal plans for a QI process, it is unlikely to occur. Participation in formal QI processes with other institutions provides a comparison of progress and motivation for improvements (58, 59).

Standard 4 for Skin-to-Skin Contact:

Parents shall be provided information about the benefits of SSC that continue for babies and parents after discharge.

- Competency 4.1: Discharge planning with parents shall include information regarding the continued value of SSC, the holding of babies, and encouragement for parents to continue SSC at home.
- Competency 4.2: Parents shall be supported in safely holding and carrying their baby after discharge, including using a baby carrier if desired.

Evidence-Based Rationale for Standard 4:

- The benefits of SSC for babies and parents continue for several months after birth and have been shown to enhance neurodevelopment and social engagement (50, 60), increase breastfeeding duration (61), and reduce the incidence of postpartum depression (60). Safety is an ongoing issue after discharge, so it should be discussed with parents during discharge planning.

Conclusions

For decades, we have had ample evidence that infant and family-centered developmental care (IFCDC) supports babies’ optimal physical, cognitive, and emotional health in intensive care. It is

also well-documented that supporting nurturing relationships between parents and babies is central to the mental health of everyone involved. Practices that are integral to IFCDC and those that directly support nurturing relationships can no longer be viewed as “optional” but must be considered *essential* to medical management and caregiving for NICU babies and their families. This requires a culture change in intensive care that is growing but, regrettably, is not yet widespread.

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A critical part of the culture change needed is a radical shift in perceptions about the role of families and in facilitating opportunities for them to interact and connect with their babies during skin-to-skin contact. Amid a highly technical environment where highly skilled professionals manage complex medical care, skin-to-skin contact places baby and mother (or father/partner) as close together as they can get after birth. It is where interrupted gestation can continue and where healing from birth trauma can begin for both baby and mother (and father/partner).

“While medical and surgical interventions are lifesaving for NICU babies, the formation of nurturing emotional connections between parents and infants is foundational to infant, parent, and family mental health and wellbeing. Ignoring or minimizing the importance of nurturing touch and nurturing connections can only be done at significant risk for sub-optimal physical and mental health for NICU babies and at great peril for decreasing the quality of life inherent to human experience.”

SSC may be the most evidence-based intervention we have in the NICU. At the same time, it is also the most under-valued and under-used intervention in many NICUs worldwide. While medical and surgical interventions are lifesaving for NICU babies, the formation of nurturing emotional connections between parents and infants is foundational to infant, parent, and family mental health and wellbeing. Ignoring or minimizing the importance of nurturing touch and nurturing connections can only be done at significant risk for sub-optimal physical and mental health for NICU babies and at great peril for decreasing the quality of life inherent to human experience.

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