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womb to world

Full-Term Newborn Monograph

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Introduction

Womb to World is a model of signal-based, family-centered care for infants and toddlers that includes five pillars: signals, sensory support, positioning, sleep & calm state and skin care. This monograph will focus on the adaptation of this model for full-term infants, as well as the active role families play in protecting and fostering the well-being of their newborn based on their infant's signals.

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PILLAR ONE: **SIGNALS**

Regardless of their gestational age at birth, infants have an innate ability to communicate via cues or signals.[1] With family-centered care, healthcare professionals assist parents in learning how to read and respond to their infant's unique signals. Autonomic signals, such as color changes or fluctuations in vital signs, and motor signals, such as changes in muscle tone or flailing of the limbs, indicate the infant is experiencing stress.[2] Responding quickly to stress signals and supporting the newborn infant with calming strategies, including non-nutritive sucking and grasping, will help mitigate stress in the moment and assist with the development of self-regulatory behaviors in the future.[3,4]

While the majority of full-term infants spend little time in a hospital,[5] healthcare providers still play an important role in guiding families in understanding their newborn's signals and adapting their caregiving accordingly.[1] Parents gain confidence as they learn to be responsive to their infant's signals while soothing and feeding. This allows parents to more readily communicate the needs of their infant to their healthcare providers in support of their infant's health and development.

Studies have shown that about 90% of communication between parents and their infants is nonverbal, and from their first day of life newborns are trying to let caregivers know what they need.[6] Infants signal they are content by being quietly alert, showing an interest in their environment by turning toward sound and making eye contact, moving smoothly and cooing.[1] Conversely, infants signal discontentment by crying, squirming or moving in a jerky manner, and grimacing.[1] Discontentment for an infant may stem from a soiled diaper, hunger, discomfort, overstimulation or pain. Healthcare providers can assist parents in learning their infant's signals of contentment and discontentment as well as how to respond appropriately.[1]

Particularly when it comes to hunger, parents may overestimate or underestimate their infant's signals. Infants indicate hunger by bringing their hands to their mouth, rooting and sucking.[7] These early signs may be subtle and can be easily missed. The next stage of hunger signals includes crying and squirming.[7] If hunger continues, newborns will become more frantic with both their crying and movements and they may need to be soothed prior to feeding.[7]

Often new parents will interpret all sucking behavior as a signal of hunger; however, sucking, for instance, on a pacifier or finger, is a calming strategy for newborns. When all sucking is interpreted as hunger, parents may overfeed their newborn infant, which can lead to gastrointestinal discomfort and alteration of hunger-satiety cycles.[7] Further confounding the issue, infants who are born with certain medical concerns, such as prematurity or small for gestational age, may need to be fed whether or not hunger cues are present in order to support adequate growth. Healthcare providers thus need to assist parents in knowing not just how to read their infant's signals but also how to intervene to best support their infant.

Infants will also signal when they are tired, but these signs may be easy to overlook. Being still and quiet, yawning and rubbing of the eyes and ears can all be signals that an infant is ready for sleep. If these sleep signals are not seen and the infant becomes upset, calming may be necessary prior to sleeping, which may reduce how much rest the infant gets before waking for the next feeding.

In our busy, modern world, newborn infants can easily become overstimulated. Healthcare providers can assist parents in learning how to identify signals that an infant has had too much stimulation. These signals may include gaze aversion by shifting the eyes away from the caregiver, finger splay or stop sign with arm extension, and arching of the back and possibly the neck.[8] To help calm an overstimulated infant, healthcare professionals can advise parents to slow the pace of an activity or simply hold the infant without speaking or caressing. In the case of arching of the spine, supporting the infant in a softer forward flexed position, starting with bringing the bottom and legs forward, may help the infant to calm.[9]

PILLAR TWO: **SENSORY SUPPORT**

The sensory systems, touch & movement, smell, taste, hearing and vision, are used to learn, explore and interact with the world. At a basic level, the senses take in environmental stimuli and contribute to a response, which is based on external input and internal processing. Infants' responses are influenced by both genetics and experience, and as they grow outside the womb, it is essential to create positive, supportive experiences.

Kinesthesia, Proprioception and Touch:

Kinesthesia and proprioception, which are known as the movement senses, allow for awareness of body position and movement in space. These sensory systems, along with touch, can be supported in the newborn via infant massage and skin-to-skin holding.[10,11] Parents should be encouraged to participate in skin-to-skin holding early and often, and they should be educated on the numerous health and developmental benefits of skin-to-skin holding.[10,12] Infant massage classes are available in many hospital and community setttings.

Taste and Smell:

Early exposure to the taste and smell of colostrum and then breast milk supports maternal-infant bonding.[13] Exposure to maternal scent via breast mik and skin-to-skin holding supports infant regulation.[14] Parents should be educated about the benefits of breastfeeding and breast milk, and mothers wanting to breastfeed should be supported by lactation consultants and other feeding experts.

Hearing:

To best support the development of hearing, caregivers should be educated on sound levels within the hospital and at home, because sound can have a significant impact on an infant's sleep and development.[15] Sound can cause an infant to startle and arouse or support calming and sleep. Additionally, infants learn about their world through language from their caregivers. Healthcare providers should model talking and singing to infants so families understand the importance of providing early language stimulation to support language development.[16]

Vision:

Newborn vision is stimulated best at a distance of about 12 inches, so parents should be encouraged to have face-to-face engagement while holding their infant to support visual development.[17] Natural lighting, with light during the day and dark at night, can aid in the establishment of circadian rhythms, which is supportive of brain development.[18]

Fathers should be included in these developmentally supportive practices as well as mothers since successful infant-father bonding has been shown to increase breastfeeding and weight gain and reduce cognitive delay in newborns.[19] Close paternal relationships are associated with higher academic achievement and socioeconomic status and lower incidence of behavioral problems as well.[19]

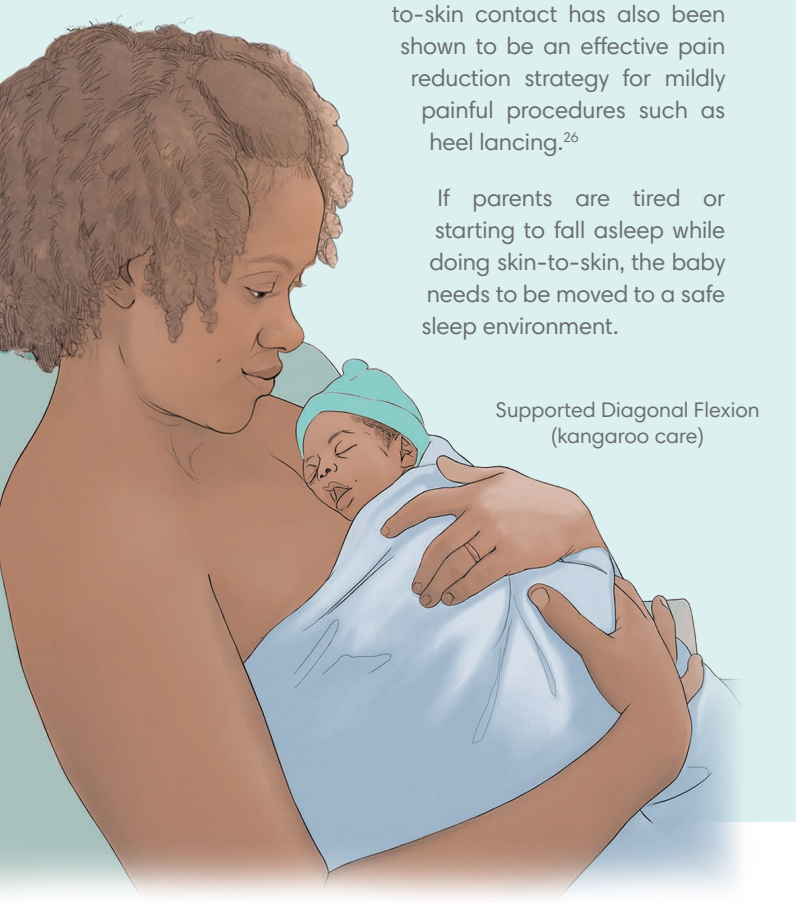
PILLAR THREE: **POSITIONING**

Healthcare professionals play an integral role in teaching parents safe and developmentally appropriate positioning techniques.[20] Infants should always be placed on their backs on a firm suface for sleep, but there are many options for infants when awake.

Skin-to-skin holding

is recommended in the first hour following delivery for healthy, term newborns, and nursing care should be designed to support this intervention.[23] Skin-to-skin contact is associated with faster weight gain and immunological benefits for infants, including decreased incidence of pneumonia, necrotizing enterocolitis, and sepsis.[24] Skin-to-skin holding is supportive of physical and emotional infant-parent attachment, which leads to reduced stress for both infants and parents.[12,25] Skin-to-skin contact has also been shown to be an effective pain reduction strategy for mildly painful procedures such as heel lancing.[26]

If parents are tired or starting to fall asleep while doing skin-to-skin, the baby needs to be moved to a safe sleep environment.



Supported Diagonal Flexion (kangaroo care)

Tummy time

is essential to support motor development and prevent skull flattening and can be started after birth when an infant is awake and supervised.[21] Sidelying can be utilized for breast or bottle feeding and for play on a firm surface. Infants often spend time in elevated supine positions in car seats, swings and other infant seats. Time spent in these devices should be minimized to reduce the risk of skull flattening, which is linked to torticollis and motor delay.[22]

Safe sleep

practices are essential in the prevention of Sudden Infant Death Syndrome (SIDS) or Sudden Unexplained Infant Death (SUID), and infants should always be placed supine in a crib or on a similar flat, firm surface for sleep. They should not be overdressed but can be swaddled with a blanket or sleepsack, which should fit below the tops of the shoulders to prevent the face from being covered. The crib or sleep surface should not have anything in it but the infant, and devices such as co-sleepers or elevated devices such as swings or car seats should never be used for sleep. If an infant falls asleep in a position or device other than supine, they should be moved to a safe sleep environment as soon as possible.[27] Additional recommendations for safe sleep, including the importance of modeling safe sleep practices in the hospital, can be found in the 2020 NANN Newborn Safe Sleep Guidelines.[28]

The AAP further recommends that infants should sleep alone but in the same room as a parent.[27,29] Co-sleeping, the practice of parents sharing a bed with their infant, has been directly correlated with SIDS as well as with decreased quality rest time due to increased night wakefulness. Quality rest time is needed to support infant neurological development.[30] Night wakefulness is directly associated with emotional and behavioral disorders later in childhood, and furthermore, couples who co-sleep with their infant in the first months of life experience greater stress in their partnership, which is an additional risk factor for their infant as it leads to increased social and behavioral disorders later in childhood.[30]

National Association of Neonatal Nurses

Newborn Safe Sleep Guidelines
National Association of Neonatal Nurses. 2020.

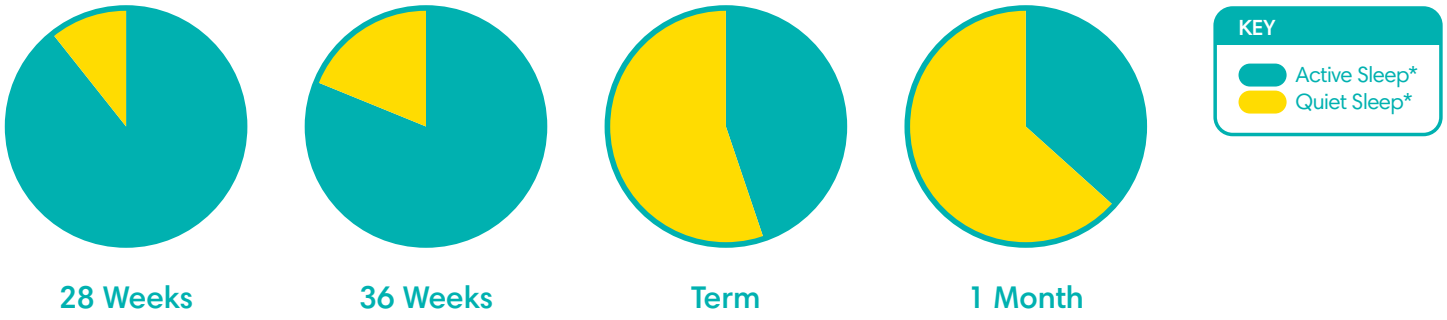
PILLAR FOUR: **SLEEP & CALM STATE**

Sleep supports infant brain development, temperature regulation and energy efficiency.[31] The neural connections formed during the newborn period are essential for development and occur most rapidly during deep sleep.[31] Supporting a healthy sleep pattern can help the infant process information, consolidate memories and conserve energy throughout their entire life.[32] Sleep also serves essential functions, such as helping maintain optimum alertness levels, improving physical and mental performance during the day and sustaining metabolism and hormone levels.[32]

The quality and quantity of newborn sleep influences learning and memory and directly impacts infant brain development and parental bonding.[33,34] Research has shown that establishment of circadian rhythm, which occurs during the first three months of infancy,[35] supports the central nervous system and is associated with improved immune function.[36]

Active Sleep vs. Quiet Sleep

*Total hours based on 24-hour sleep-and-wake cycle



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Calm behavior in infants supports their development of self-regulation, and healthcare providers can model calming techniques, such as holding and providing skin-to-skin care, to support parents in learning to promote a calm state with their infants.[37] Holding, gentle rocking or swaying, and non-nutritive sucking, such as with a pacifier, can all be used to help an infant achieve a calm state and transition to sleep.[38]

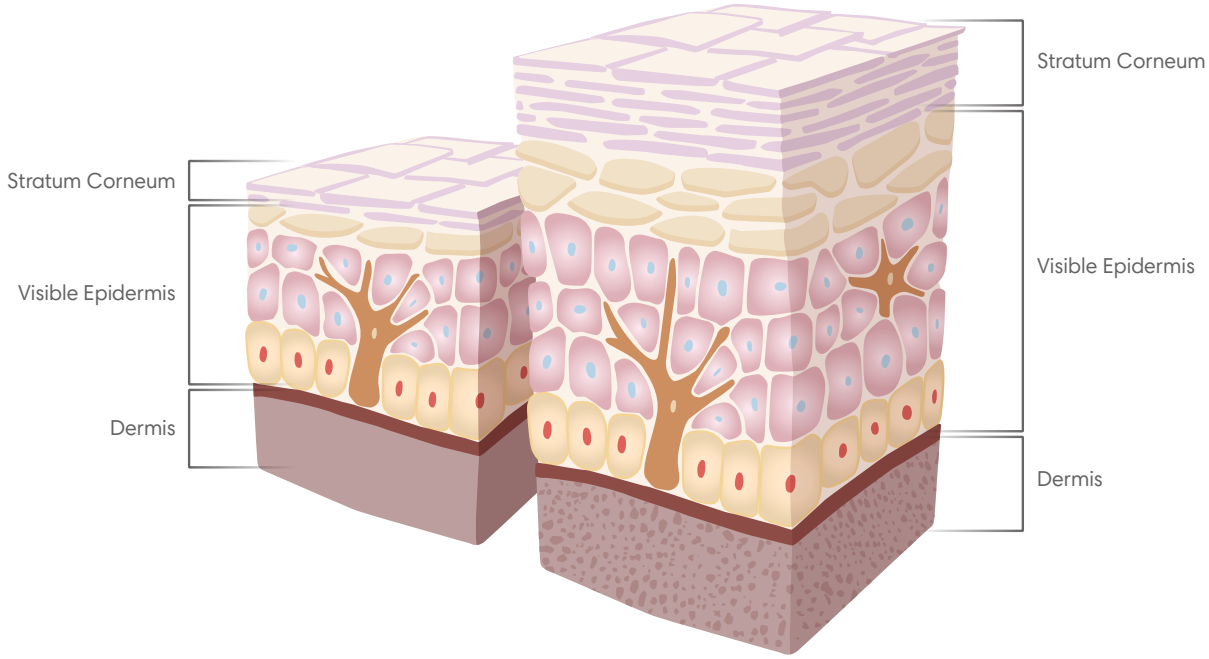
PILLAR FIVE: **SKIN CARE**

Skin is the body's largest organ, and from birth, it provides a barrier against water loss, infection, UV exposure, and irritants while allowing for thermoregulation and tactile discrimination.[39,40] Newborn skin care is essential to protect infant skin and prevent injury, dehydration or early exposure to irritants, which may negatively impact development or lead to skin conditions later in life.[41]

Newborn skin is fully formed at birth and made up of three distinct layers. The outermost layer, the stratum corneum, provides a critical barrier from irritants, but it is thinner in infants than it will be later in life, which increases the risk of transepidermal water loss (TEWL) and contamination from microbes and irritants.[42,43] Age, weight and body and environmental temperatures all directly affect TEWL, which occurs when water passes through the dermis and evaporates from the skin surface and can lead to poor thermal regulation and electrolyte imbalances.[44]

Just beneath the stratum corneum is the epidermis, which is also thinner in infants and has a higher cell turnover rate than adult skin. This may be why wounds often heal faster in full-term infants than in adults.[45] The innermost layer, the dermis, contains collagen that is shorter and less dense, which makes skin feel soft.[41] Between the epidermis and dermis are fibrils that connect the layers and provide functional integrity; as infants grow and mature, these fibrils increase in both number and strength.[41]

Skin Development of Premature vs. Full-Term Babies



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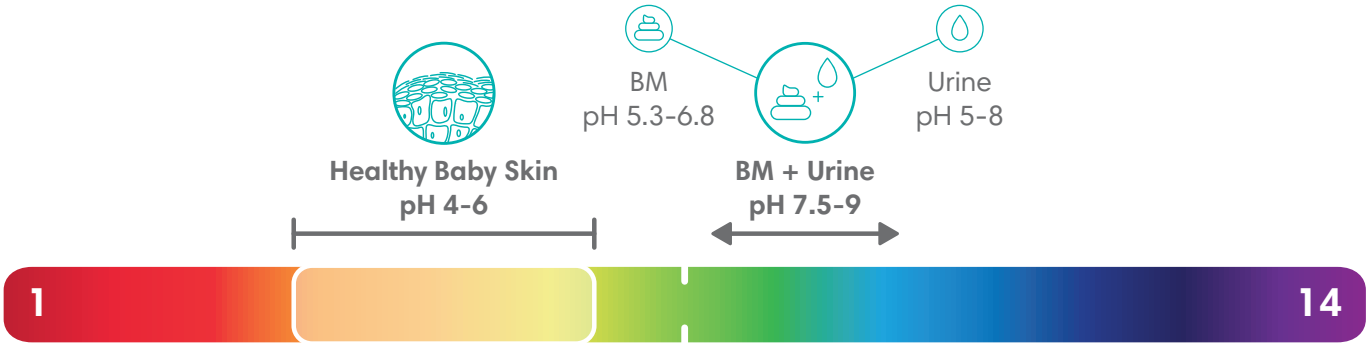
National Association of Neonatal Nurses

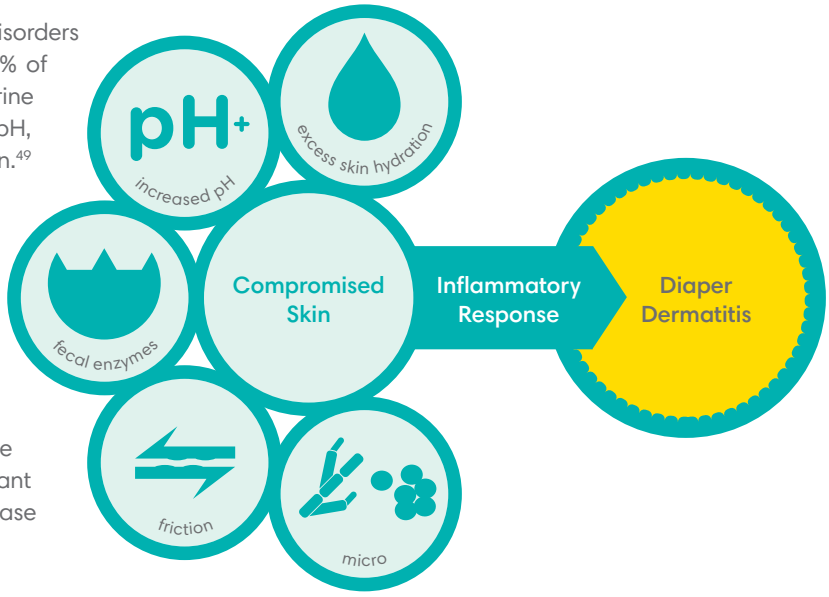
Skin Care Tips & Guidelines for Healthcare Professionals

AWHONN/NANN recommends assessing neonatal skin integrity from head to toe at least one time per day, including checking under all medical devices, using warm sterile water when bathing areas with skin breakdown, using petrolatum-based ointments or products containing zinc oxide at every diaper change for infants at risk of diaper dermatitis and using superabsorbent disposable diapers with frequent changes while maintaining developmentally supportive care practices in order to best support infant skin.[41]



Following birth, newborn infant skin goes through an adaptation process as the infant moves from the aquatic environment in utero to the outside world. The skin is covered with vernix caseosa, a waxy protective coating that is predominantly made of water but also includes proteins, lipids and antimicrobial peptides.[46] This coating protects the infant from water exposure, facilitates the development of the stratum corneum[39] and helps develop the skin's acid mantle, which inhibits pathogenic microorganism growth and supports the immune system.[47] Full-term infants are born with a skin pH > 6.0, but this decreases rapidly until it stabilizes at a pH of 5.5, which is then maintained into adulthood.[39,44]

Diaper dermatitis is broadly defined as any number of skin disorders occurring in the diapered area, and it accounts for up to 25% of infant doctor visits.[48] Recent studies have shown that when urine and feces combine and remain on the skin, they increase skin pH, activating fecal enzymes and breaking down the top layer of skin.[49] The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) and The National Association of Neonatal Nurses (NANN) recommend reducing diaper dermatitis risk by performing regular skin assessments, changing diapers frequently and using petrolatum-based ointments at every diaper change, as well as identifyng and treating diaper dermatitis based on type and degree of skin breakdown. Healthcare professionals can further support decreased frequency and severity of diaper dermatitis by encouraging the use of hypoallergenic, superabsorbent, disposable diapers, infant wipes and barrier creams to maintain healthy skin pH and decrease fecal enzyme activity.[48]



AWHONN/NANN provide further recommendations to support newborn skin, including daily head-to-toe nursing assessments using a valid and reliable tool, such as their Neonatal Skin Condition Score, to measure skin conditions objectively,[41] bathing using warm tap water with mild, gentle cleanser according to hospital or clinic protocols (immersion bathing, swaddled bathing and/or sponge bathing), ensuring hospital bath equipment is not cross-contaminated between infants, and cleaning the umbilical cord and surrounding skin surface carefully.

Bath time is an important bonding experience for infants and parents, and healthcare professionals have a special responsibility to demonstrate proper care techniques and behaviors, so they may be imitated by parents once the infant is discharged.[1] Parents should be instructed to only bathe their infants every 3-4 days as infant skin is more water-permeable than adult skin, and overbathing can compromise skin integrity.[50] Swaddled bathing, in which the infant is swaddled in a thin blanket or cloth prior to immersion in water, can help reduce stress for infant and parent and is often recommended for an infant's first bath.[50]

Conclusion

The Womb to World concept of family-centered, signal-based care for infants allows healthcare providers to guide parents in caring for their infants with the goal of promoting long-term health and development. **As bedside nurses and other healthcare providers assist parents in learning about infant signals, sensory support, positioning, sleep & calm state, and skin care, they encourage parents to become active participants in their child's well-being.** Providing parents with evidence-based information starts them on a journey to gain confidence in their ability to provide the very best care to their infants.

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Notes

Notes

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