Supporting Evidence for Maternity Practices in Infant Nutrition and Care (mPINC)

CDC calculates mPINC scores for participating hospitals to indicate their overall level of maternity care practices and policies that support optimal infant feeding. Scoring of practices and policies is consistent with recommendations from national and international experts in infant feeding within maternity care settings and supported by evidence from peer-reviewed research.

Maternity Care Practices Supportive of Breastfeeding
Rationale
Results from systematic reviews and meta-analyses show that maternity care practices supportive of breastfeeding, as demonstrated by adherence to the Baby-Friendly Hospital Initiative's Ten Steps for Successful Breastfeeding (Ten Steps), are associated with improved breastfeeding outcomes. The Ten Steps are associated with improved breastfeeding initiation, breastfeeding exclusivity, and breastfeeding duration.[1-4]
Results also show a dose response relationship between the number of Baby-Friendly practices experienced and the likelihood for improved breastfeeding outcomes, indicating that the probability of improving breastfeeding outcomes increases with a mother and infant from exposure to the Ten Steps initiative.[1]
Baby-Friendly practices may also help to decrease racial and ethnic inequities in breastfeeding outcomes.[5]
Adherence to the Ten Steps may not significantly increase hospital birth costs.[6,7]

Immediate Postpartum Care		
Measure	**Explanation**	**Rationale**
Immediate skin-to-skin contact	After vaginal delivery, how many newborns remain in uninterrupted skin-to-skin contact with their mothers beginning immediately after birth • If breastfeeding, until the first breastfeeding is completed? • If not breastfeeding, for at least one hour?	Skin-to-skin contact can be implemented for all healthy term newborns, regardless of feeding method, immediately after birth.[8-15] Skin-to-skin contact improves breastfeeding outcomes[14-15] and increases infant cardio-respiratory stability and blood glucose levels.[14] Skin-to-skin contact may also improve mother-infant bonding[15] and infant thermoregulation[15] and decrease infant crying[14] and pain response.[15]
Immediate skin-to-skin contact	After Cesarean-delivery, how many newborns remain in uninterrupted skin-to-skin contact with their mothers as soon as the mother is responsive and alert after birth • If breastfeeding, until the first breastfeeding is completed? • If not breastfeeding, for at least one hour?	Skin-to-skin contact can be safely implemented immediately following cesarean-delivery as soon as the mother is responsive and alert.[10,12,13,16] Skin-to-skin contact after cesarean-deliveries improves breastfeeding outcomes [14-17] and may also improve mother-infant bonding, maternal pain and anxiety, and maternal and infant stabilization.[16]
Transition	How many vaginally-delivered newborns are separated from their mothers before starting rooming-in?	Separation before rooming in is unnecessary for stable infants. All routine procedures, assessments, screenings, immunizations, and laboratory draws can be performed during skin-to-skin contact or at the mother's bedside.[10-12] Early mother-infant separation may lead to poorer mother-infant interaction during breastfeeding[18] and could affect early initiation of breastfeeding.[19]
Monitoring following birth	How many newborns receive continuous observed monitoring throughout the first 2 hours immediately following birth?	Continuous monitoring of newborn breathing, activity, color, tone, and position may improve safety during skin-to-skin contact by averting obstruction of breathing and events leading to sudden unexpected postnatal collapse.[10,12]

Rooming-In		
Measure	**Explanation**	**Rationale**
Rooming-in	What percent of newborns stay in the room with their mothers for at least 24 hours per day (not including those separated for medical reasons)?	Continuous rooming-in allows mothers to learn to recognize and respond to their infants' feeding cues.[8,10,13] Rooming-in may improve early exclusive breastfeeding,[20] reduce infant stress,[21] and increase mother-infant bonding.[18]
Mother-infant separation	Where are newborns usually located during each of the following situations? Click one location per	All routine procedures, assessments, screenings, immunizations, and laboratory draws can be performed during skin-to-skin contact or at the

	situation. For situations addressed in multiple locations in your hospital, choose the most frequently-used location. • Pediatric exams/rounds • Hearing screening • Pulse oximetry screening • Routine labs/blood draws/injections • Newborn bath.	mother's bedside to minimize mother-infant separation.[10-12] Early separation may interfere with mother-infant interaction during breastfeeding and lead to poorer mother-infant interaction during breastfeeding.[18]
Rooming-in safety	Does your hospital have a protocol that requires frequent observations of high-risk mother-infant dyads by nurses to ensure safety of the infant while they are together?	To increase safety during rooming-in, it is important for health care providers to monitor mother-infant dyads according to their risk assessment.[10,12] Assessment tools to help facilitate safety are available.[22]

Feeding Practices

Measure	Explanation	Rationale
Formula feeding of breastfed infants	What percent of healthy, term breastfed newborns are fed infant formula?	Formula supplementation for healthy term newborns is not recommended unless medically indicated.[8-9,13,23-24] Early supplementation with formula is associated with poorer breastfeeding outcomes.[25-30]
Glucose monitoring	Does your hospital perform routine blood glucose monitoring of full-term healthy newborns who are NOT at risk for hypoglycemia?	Exclusive breast milk feeding is sufficient to meet the nutritional and metabolic needs of most healthy, full-term newborns.[24,31] Transiently low blood glucose levels are common after birth as newborns adapt to their postnatal environment.[24,32] Routine blood glucose monitoring of healthy, full-term newborns who are not at risk for hypoglycemia is unnecessary, may hinder the successful establishment of breastfeeding, and is not recommended.[24,31-33] Routine glucose monitoring should only be performed on infants at increased risk of developing hypoglycemia and those with clinical signs of hypoglycemia.[24,32]
Formula counseling for breastfeeding mothers	When breastfeeding mothers request infant formula, how often do staff counsel them about the possible consequences to the health of their infant and the success of breastfeeding?	Counseling breastfeeding mothers about the possible consequences of introducing infant formula gives them information to make an informed decision.[12-13,23] Early supplementation with formula is associated with poorer breastfeeding outcomes.[25-28]

Feeding Education and Support

Measure	Explanation	Rationale
Formula preparation and feeding techniques	Among mothers whose newborns are fed any formula, how many are taught appropriate formula feeding techniques and how to safely prepare and feed formula?	For mothers who formula feed, it is important they have information on safe preparation, feeding, handling, and storage of infant formula.[12] Many mothers do not follow safe formula preparation practices.[34] Infant formula is perishable and powdered infant formula can be contaminated with pathogens that can cause infections.[35-36] Bottles and nipples can also become contaminated when improperly cleaned.[35-37] Over and under-diluted formula can result in unmet nutritional needs and other infant health problems.[35] Correct preparation and handling of formula reduce the risk of illness and other health problems.[35-37]
Feeding cues and pacifiers	How many breastfeeding mothers are taught or shown how to: • Recognize and respond to their newborn's feeding cues? • Breastfeed as often and as long as their newborn wants without restrictions? • Understand the use and risks of artificial nipples and pacifiers?	It is important that breastfeeding mothers are educated on skills and strategies that promote successful breastfeeding and are offered support to help facilitate successful breastfeeding.[11-13,38] Breastfeeding education and support improve breastfeeding outcomes.[39-40] Effective breastfeeding relies on feeding in direct response to specific infant cues rather than scheduled frequency or duration of feedings.[41] Artificial nipples and pacifiers may decrease breastfeeding duration and exclusivity.[42-43]
Identify/solve breastfeeding problems	How many breastfeeding mothers are taught or shown how to: • Position and latch their newborn for breastfeeding?	It is important that breastfeeding mothers are educated on skills and strategies that promote successful breastfeeding and are offered support to help facilitate successful breastfeeding.[11-13,38] Breastfeeding education and support improve breastfeeding outcomes.[39,40] Improper positioning and latching may contribute to breastfeeding cessation and

	• Assess effective breastfeeding by observing their newborn's latch and the presence of audible swallowing? • Assess effective breastfeeding by observing their newborn's elimination patterns (i.e., urine and stool output and stool character)? • Hand express their breast milk?	supplementation.[44] Newborn elimination patterns can provide indication that the infant is getting sufficient milk.[45] Hand expression instruction may help mothers self-manage engorgement-related pain.[46]

Discharge Support

Measure	Explanation	Rationale
Pre-discharge criteria	Do your discharge criteria for breastfeeding newborns require direct observation of at least one effective feeding at the breast within the 8 hours prior to discharge?	To help facilitate continued successful breastfeeding, it is important that a trained health professional perform an assessment of breastfeeding effectiveness at least once within the 8 hours before the mother and baby are discharged from the hospital.[38]
Post-discharge follow-up visit	Do your discharge criteria for breastfeeding newborns require scheduling of the first follow-up visit with a health care provider?	A follow-up appointment with a health care provider 48 to 72 hours after discharge is important to observe feeding and assess an infant's weight and general health and hydration.[9,38,47]
Post-discharge breastfeeding support	What discharge support does your hospital routinely provide to breastfeeding mothers? • In-person follow-up visits/appointments for lactation support? • Personalized phone calls to mothers to ask about breastfeeding (not automated calls)? • Formalized, coordinated referrals to lactation providers in the community when additional support or follow-up is needed?	At discharge, hospitals can schedule follow-up appointments for lactation support and provide referrals to lactation providers in the community when needed.[12-13,38] Breastfeeding support that includes lactation specialists is associated with improved breastfeeding outcomes.[48] Telephone support for mothers during the early postpartum period is associated with improved breastfeeding outcomes.[49]
Distribution of infant formula or formula-related supplies/coupons as gifts	Does your hospital give mothers any of the following items free of charge, as gifts or free samples (not including items prescribed as part of medical care)? • Infant formula? • Feeding bottles, bottle nipples, nipple shields, or pacifiers? • Coupons, discounts, or educational materials from companies that make or sell infant formula or feeding products?	Hospital distribution of discharge packs containing infant formula or infant formula commercial advertising materials may imply to mothers that hospital staff are suggesting formula feeding.[13,38] Receipt of formula packs at hospital discharge is associated with poorer breastfeeding outcomes.[30,50-52]

Institutional Management

Measure	Explanation	Rationale
Nurse skill competency	Are nurses required to demonstrate competency in the following skills? Click all that apply: • Placement and monitoring of the newborn skin-to-skin with the mother immediately following birth? • Assisting with effective newborn positioning and latch for breastfeeding? • Assessment of milk transfer during breastfeeding • Assessment of maternal pain related to breastfeeding? • Teaching hand expression of breast milk? • Teaching safe formula preparation and feeding?	It is important that hospital staff who provide maternity care have knowledge, skills, and competence in comprehensive breastfeeding management. Regular assessment of staff's competency in infant feeding management helps ensure that mothers receive the appropriate care and assistance to successfully initiate and maintain breastfeeding.[13] Hospital staff breastfeeding education and training is associated with improved breastfeeding knowledge, attitudes, practices, and outcomes.[53-59] The United States Breastfeeding Committee (USBC) has developed a comprehensive list of core competencies for breastfeeding for health professionals. These competencies have been endorsed by several associations and organizations.[60-61] The World Health Organization (WHO) has also developed a comprehensive list of competencies for hospital staff who help mothers with infant feeding.[13]
Nurse competency assessment	How often are nurses formally assessed for clinical competency in breastfeeding support and lactation management?	It is important that staff's knowledge and skills about breastfeeding management, mother-infant care, interpersonal communications, and counseling should be assessed at hiring and periodically thereafter.[12] WHO's global standard is defined as: at least 80% of health professionals who provide antenatal, delivery, or newborn care report receiving competency assessments in breastfeeding in the previous 2 years.[13]

		Hospital staff breastfeeding education and training is associated with improved breastfeeding knowledge, attitudes, practices, and outcomes.[53-59]
Documentation of exclusive breastfeeding	Does your hospital record keep track of exclusive breastfeeding throughout the entire hospitalization?	All Joint Commission-accredited hospitals with at least 300 live births each year must record exclusive breastfeeding throughout an infant's entire hospitalization.[62-63] WHO also recommends that facilities record and track information on exclusive breastfeeding for all infants.[13] Hospital documentation of exclusive breastfeeding may increase breastfeeding initiation .[64]
Acquisition of infant formula	How does your hospital acquire infant formula?	The International Code of Marketing of Breast-milk Substitutes and related World Health Assembly resolutions encourages hospitals to purchase formula and feeding devices at fair market value.[12,65] American Dietetic Association guidelines for mandatory elements of infant formula hazard analysis and critical control points (HACCP) plans apply to purchased and free infant formula.[66] The Institute of Medicine recognizes the inherent conflict of interest this kind of financial support introduces.[67] Implementation of hospital policy for market price purchasing of infant formula has been found to be associated with reduced in-hospital formula supplementation and increased in-hospital exclusive breastfeeding and breastfeeding duration.[68]
Written policies	Which of the following are included in a written policy (or policies) at your hospital? Policy requiring: • Documentation of medical justification or informed parental consent for giving non-breast milk feedings to breastfed newborns? • Formal assessment of staff's clinical competency in breastfeeding support? • Documentation of prenatal breastfeeding education? • Staff to teach mothers breastfeeding techniques? • Staff to show mothers how to express breast milk? • Purchase of infant formula and related breast milk substitutes by the hospital at fair market value? • Staff to provide mothers with resources for support after discharge? • Placement of all newborns skin-to-skin with their mother at birth or soon thereafter? • The option for mothers to room-in with their newborns?	Written hospital breastfeeding policies are associated with increased breastfeeding.[69-70] The Academy of Breastfeeding Medicine (ABM) has developed a Model Maternity Policy Supportive of Breastfeeding that facilities can model their own institutional policies after.[12] Ideal hospital breastfeeding policies should generally cover The WHO's Ten Steps to Successful Breastfeeding and the WHO's International Code of Marketing of Breast-milk Substitutes.[12-13]

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