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The SOFFI Reference Guides: Text, Algorithms, and Appendices: A Manualized Method for Quality Bottle Feedings

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Abstract

The Support of Oral Feeding for Fragile Infants (SOFFI) method of bottle feeding rests on quality evidence along with implementation details drawn from clinical experience. To be clear, the SOFFI Method is not focused on the amount of food taken in but on the conduct of the feeding and the development of competent infant feeding behavior that, consequently, assures the intake of food necessary for growth. The unique contribution of the SOFFI method is the systematic organization of scientific findings into clinically sound, easily followed algorithms and a manualized Reference Guide for the assessments, decisions, and actions of a good quality feeding. A good quality feeding is defined by a stable, self-regulated infant and a caregiver who sensitively (responsively) adjusts to the infant's physiology and behavior to realize a feeding experience in which the infant remains comfortable and competent while using feeding abilities achieved to that point. The SOFFI Reference Guide and Algorithms begin with pre-feeding adjustments of the environment and follow step by step through a feeding with observations of specific infant behavior, decisions based on that behavior, and specific actions to safeguard emerging abilities and the quality of the experience. An important aspect the SOFFI Reference Guide and Algorithms is the clarity about pausing and stopping the feeding based on the infant's physiology and behavior rather than based on the amount ingested. The specificity of each observation, decision, and action enables nurses at all levels of experience to provide quality feedings based on scientific rationale and, therefore, to assist parents in learning to feed their infants successfully. The theoretical framework and scientific basis of the SOFFI method are found in Ross and Philbin (2011).¹

Keywords

NICU; preterm infant; bottle; feeding; behavior; algorithm; manual; guide; quality; nursing care; SOFFI; High risk; premature; infant; bottle; feeding

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Conflicts of interest:

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The SOFFI Reference Guide, algorithms and appendices are a manualized clinical resource for bottle feeding preterm, ill, and fragile infants with empirical research providing the definition of quality. The algorithms guide a clinician through assessments, decisions, and consequent actions. At points of assessment and action the algorithms indicate the lettered and numbered section of the SOFFI Reference Guide that contains relevant information or guidance. Each section of the Guide includes a brief statement of the topic, the details of the assessment or course of action that would result in a good quality feeding and details of conditions or actions that would likely diminish the quality of the feeding.

One would not refer to the SOFFI materials or make notes during a feeding as this would distract attention from the infant and be disruptive. While learning the method one would study its scientific basis¹, algorithms, reference guide, and appendices away from the bedside, practice remembering the details of a specific feeding, and subsequently use the SOFFI resources for self-evaluation. Practice in remembering the details of the feeding has a secondary benefit of sharpening one's attention to infant behavior generally. Nurses can learn in pairs by arranging for one to silently observe the other during a feeding, identifying the assessments made and actions taken, and both reviewing the feeding together afterward, away from the bedside.

The SOFFI method and its scientific basis are fully described in Ross & Philbin (2011).¹ A brief summary is provided here.

The primary objective of the SOFFI method is the development of an infant's competence in feeding in the context of pleasurable, relaxed, and controlled feeding experiences. This results in associating hunger, feeding, and food with rewarding/pleasurable experience. Feeding competence is generally well developed in a term newborn before birth and before requirements of ingesting food for growth. Therefore, the adult's (usually parent's) skill in making feeding enjoyable usually involves more or less simple adjustments to an infant's individual characteristics. By contrast, feeding competence may be lacking or minimally developed in a preterm, ill, or fragile infant when the requirement of ingesting food for growth is imposed. In this case considerable skill is required to bring an infant to competence in feeding with solid pleasurable associations between hunger, feeding and food. It is not difficult to "make" a preterm infant swallow milk/formula from a bottle with weight gain as the goal. However, an infant whose feedings are driven by this goal is at risk for acquiring defensive or problematic feeding behavior, a solid association between feeding and discomfort such as struggling to breathe and, consequently, an aversion to food and feeding.

The SOFFI algorithms, Reference Guide, and appendices are successful resources for nurses and others to acquire the professional skills necessary to provide pleasant experiences before, during, and after feeding even though the infant has immature or atypical feeding abilities. To do this the caregiver uses the infant's behavior to guide adjustments that maintain physiologic stability, enjoyment of the experience, and the competence of emerging abilities. For example, direct supports for a bottle-fed infant may include selecting an appropriate nipple or eliminating pre-feeding activities that cause fatigue. Indirect supports may include adjusting light and noise levels and actively managing one's own attention, emotional state, and behavior.²⁻⁶

The following is an example of using the SOFFI feeding algorithm to assess, decide, and act in order to maintain a comfortable, competent feeding experience for a beginning feeder.

At **START** the physical environment is adjusted to the needs of the infant as much as possible (Guide A) and the infant has previously shown stability during routine care (Guide B). The nurse now determines that the infant is physiologically stable

lying undisturbed in bed at the time of the particular feeding (Guide E) and showing readiness by wakening somewhat and mouthing the blanket. When he is picked up, however, the respiratory rhythm becomes somewhat irregular (Guide F). Observing this, the nurse decides to support a return to physiologic stability by carefully swaddling the infant in a blanket, and holding quietly. Soon after, the nurse offers a pacifier for pre-feeding non-nutritive sucking. The infant accepts the pacifier and, with sucking, returns to stable respirations and becomes more awake (Guide F). The nurse then offers the bottle with a standard nipple (Guide G). The infant feeds with good suck-swallow-breathe coordination including regularly pausing to breathe between 3 to 5 suck-swallows and maintaining physiologic stability (Guide B). The feeding continues with evidence of the infant's physiologic stability. The nurse assesses the level of participation noting good tone through the face and regular suck-swallow-breath patterns (Guide H). Assessing efficiency (Guide I) she notes that there is no milk around the outside of the nipple, no gulping sounds, and the sucks are extracting sufficient milk from the bottle. She continues the cycle of observations through stability, participation, efficiency, and self-pacing. Later, however, the infant begins to drip milk around the nipple, has longer periods between sucking bursts, appears more sleepy, and has less tone throughout the body and face (Guide H). She judges that the infant is tired and temporarily stops the feeding to rest and reorganize while holding him quietly in alignment in a vertical position. (There is no back patting/rubbing to force a burp.) [By contrast, if there was dripping around the nipple but good facial tone and active sucking, the nurse would assess the sucking as inefficient (Guide I). In this case, she would stop the feeding to change the nipple to one with a slower flow rate, observing whether this corrects the spillage (Flow Rate / Nipple Selection algorithm and Appendix A).] The infant burps spontaneously, becomes more drowsy, and resists taking the nipple. The nurse then decides to stop the feeding (**STOP**, Guide C & D), holds the infant somewhat upright for a few minutes to facilitate a further burp, and returns him to bed either wrapped as during the feeding or unwrapped, leaving him undisturbed, on top of the blanket in which he was held. [Had the infant actively accepted the nipple after resting and continued to feed, the nurse would follow his lead continuing with assessments and decisions around the algorithm.]

The SOFFI Reference Guide was developed from a variety of sources but particularly from the writings, research, and clinical knowledge of Als, Browne, Ross, and Philbin.⁴⁻¹² More complete descriptions of the outward signs of infant stability and behavioral organization and of contingent (sensitive) caregiver responses are described in the abundant literature on the subject.^{6, 7, 10, 11, 13-15} Additional evidence supporting the SOFFI method and Reference Guide is found in a variety of resources.^{4-6, 9, 10, 16-33} Skill training programs that address preterm and high risk infant feeding include the Newborn Individualized Developmental Care and Assessment Program (NIDCAP), the Fragile Infant Feeding Institute (FIFI), the Family Infant Relationship Support Training (FIRST), and Made to Order.^{4-9, 13, 14, 27, 34-37}

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

1. Ross ES, Philbin MK. SOFFI: An evidence-based method for quality bottle-feedings with preterm, ill, and fragile infants. *Journal of Perinatal and Neonatal Nursing*. 2011 in press.
2. Gray L, Philbin MK. Effects of the neonatal intensive care unit on auditory attention and distraction. *Clin Perinatol*. 2004; 31:243–260. vi. [PubMed: 15289031]
3. Philbin MK, Ballweg DD, Gray L. The effect of an intensive care unit sound environment on the development of habituation in healthy avian neonates. *Dev Psychobiol*. 1994; 27:11–21. [PubMed: 8112485]
4. Als H, Gilkerson L. The role of relationship-based developmentally supportive newborn intensive care in strengthening outcome of preterm infants. *Semin Perinatol*. 1997; 21:178–189. [PubMed: 9205974]
5. Browne JV, MacLeod AM, Smith-Sharp S. The Family Infant Relationship Support Training Program (FIRST®), Training Guide. Denver, CO: The Denver Children's Hospital Association, The Center for Family and Infant Interaction. 2001
6. VandenBerg KA. Nippling management of the sick neonate in the NICU: the disorganized feeder. *Neonatal Netw*. 1990; 9:9–16. [PubMed: 2381414]
7. Als H, Gilkerson L. Developmentally supportive care in the neonatal intensive care unit. *Zero to Three*. 1995; 15:1–9.
8. Als, H.; Gibes, R. Training Guide. Boston: Children's Hospital; 1990. Newborn Individualized Developmental Care and Assessment Program (NIDCAP).
9. Browne, J.; Ross, E. Training Curriculum. Denver, CO: Center for Family and Infant Interaction, JFK Partners; 2000. The Rocky Mountain Fragile Infant Feeding Institute (RMFIFI).
10. Ross ES, Browne JV. Developmental progression of feeding skills: an approach to supporting feeding in preterm infants. *Seminars in Neonatology*. 2002; 7:469–475. [PubMed: 12614599]
11. Philbin MK. The influence of auditory experience on the behavior of preterm newborns. *J Perinatol*. 2000; 20:S77–S87. [PubMed: 11190705]
12. Philbin MK, Klaas P. Hearing and behavioral responses to sound in full-term newborns. *J Perinatol*. 2000; 20:S68–S76. [PubMed: 11190704]
13. Kleberg A, Hellstrom-Westas L, Widstrom AM. Mothers' perception of Newborn Individualized Developmental Care and Assessment Program (NIDCAP) as compared to conventional care. *Early Hum Dev*. 2007; 83:403–411. [PubMed: 17112689]
14. Lawhon G. Facilitation of parenting the premature infant within the newborn intensive care unit. *J Perinat Neonatal Nurs*. 2002; 16:71–82. [PubMed: 12083296]
15. Pridham KF, Sondel S, Chang A, Green C. Nipple feeding for preterm infants with bronchopulmonary dysplasia. *J Obstet Gynecol Neonatal Nurs*. 1993; 22:147–155.
16. Ancona J, Shaker CS, Puhek J, Garland JS. Improving outcomes through a developmental approach to nipple feeding. *J Nurs Care Qual*. 1998; 12:1–4. [PubMed: 9610007]
17. Pickler RH. A Model of Feeding Readiness for Preterm Infants. *Neonatal Intensive Care*. 2004; 17:31–36. [PubMed: 16429606]
18. Pickler RH, Best AM, Reyna BA, Wetzel PA, Gutcher GR. Prediction of feeding performance in preterm infants. *Newborn and Infant Nursing Reviews*. 2005; 5:116–123. [PubMed: 16467910]
19. Pickler RH, Reyna BA. A descriptive study of bottle-feeding opportunities in preterm infants. *Advances in Neonatal Care*. 2003; 3:139–146. [PubMed: 12891838]
20. Pridham K, Brown R, Clark R, et al. Effect of guided participation on feeding competencies of mothers and their premature infants. *Res Nurs Health*. 2005; 28:252–267. [PubMed: 15884024]
21. Pridham K, Sondel S, Chang A, Green C. Nipple feeding for preterm infants with bronchopulmonary dysplasia. *Journal of Obstetric and Gynecologic Nursing*. 1993; 22:147–155.
22. Shaker CS. Nipple feeding preterm infants: an individualized, developmentally supportive approach. *Neonatal Netw*. 1999; 18:15–22. [PubMed: 10418433]

23. Shaker CS, Woida AM. An evidence-based approach to nipple feeding in a level III NICU: nurse autonomy, developmental care, and teamwork. *Neonatal Netw.* 2007; 26:77–83. [PubMed: 17402599]
24. Thoyre S. Feeding Outcomes of Extremely Premature Infants After Neonatal Care. *Journal of Obstetric, Gynecologic, & Neonatal Nursing.* 2007; 36:366–376.
25. Thoyre SM, Brown RL. Factors contributing to preterm infant engagement during bottle-feeding. *Nurs Res.* 2004; 53:304–313. [PubMed: 15385867]
26. Thoyre SM, Shaker CS, Pridham KF. The early feeding skills assessment for preterm infants. *Neonatal Netw.* 2005; 24:7–16. [PubMed: 15960007]
27. Browne, J.; Ross, E. Rocky Mountain Fragile Infant Feeding Institute (RMFIFI) Training curriculum. Denver, CO: University of Colorado Health Sciences Center; 2001. BROSS: Baby regulated organization of systems and sucking.
28. Pickler RH, Frankel HB, Walsh KM, Thompson NM. Effects of nonnutritive sucking on behavioral organization and feeding performance in preterm infants. *Nurs Res.* 1996; 45:132–135. [PubMed: 8637792]
29. Palmer MM. Identification and management of the transitional suck pattern in premature infants. *J Perinat Neonatal Nurs.* 1993; 7:66–75. [PubMed: 8336292]
30. McCain GC. An evidence-based guideline for introducing oral feeding to healthy preterm infants. *Neonatal Network - Journal of Neonatal Nursing.* 2003; 22:45–50.
31. Reau NR, Senturia YD, Lebailly SA, Christoffel KK. Infant and toddler feeding patterns and problems: normative data and a new direction. Pediatric Practice Research Group. *J Dev Behav Pediatr.* 1996; 17:149–153. [PubMed: 8783060]
32. Medoff-Cooper, B.; Philbin, MK.; Mancini, T.; Abbasi, S. Pediatric Academic Societies/Society for Pediatric Research. Baltimore, MD: 2009. Feeding Progression in Preterm Infants from 40 weeks PCA to 3 months Corrected Age.
33. Philbin, MK.; Medoff-Cooper, B.; Mancini, T.; Abassi, S. Pediatric Academic Societies/Society for Pediatric Research. Vancouver, BC: 2010. Quality or Quantity: what controls the decision to stop a NICU bottle feeding?.
34. Als H. Toward a synactive theory of development: Promise for the assessment and support of infant individuality. *Infant Mental Health Journal.* 1982; 3:229–243.
35. Lawhon G. Providing developmentally supportive care in the newborn intensive care unit: an evolving challenge. *J Perinat Neonatal Nurs.* 1997; 10:48–61. [PubMed: 9214963]
36. Kleberg A, Westrup B, Stjernqvist K. Developmental outcome, child behaviour and mother-child interaction at 3 years of age following Newborn Individualized Developmental Care and Intervention Program (NIDCAP) intervention. *Early Hum Dev.* 2000; 60:123–135. [PubMed: 11121675]
37. Philbin, MK. Madeto Order. Houston, TX: Memorial Hermann Children's Hospital; 1996.
38. Graven S, Browne J. Sensory Development in the Fetus, Neonate, and Infant: Introduction and Overview. *Newborn & Infant Nursing Reviews.* 2008; 8:169–172.
39. Als H, Brazelton TB. A new model of assessing the behavioral organization in preterm and fullterm infants: two case studies. *J Am Acad Child Psychiatry.* 1981; 20:239–263. [PubMed: 7196421]
40. Gerhardt KJ. Characteristics of the fetal sheep sound environment. *Semin Perinatol.* 1989; 13:362–370. [PubMed: 2683107]
41. Gerhardt KJ, Abrams RM. Fetal exposures to sound and vibroacoustic stimulation. *J Perinatol.* 2000; 20:S21–S30. [PubMed: 11190697]
42. White RD. Recommended standards for newborn ICU design. *J Perinatology.* 2006; 26:S2–S18.
43. DeCasper AJ, Spence MJ. Prenatal maternal speech influences on newborns' perception of speech sounds. *Infant Behavior and Development.* 1986; 9:133.
44. DeCasper AJ, Fifer WP. Of human bonding: newborns prefer their mothers' voices. *Science.* 1980; 208:1174–1176. [PubMed: 7375928]
45. Moon CM, Fifer WP. Evidence of transnatal auditory learning. *J Perinatol.* 2000; 20:S37–S44. [PubMed: 11190699]

46. Lecanuet JP, Granier-Deferre C, Busnel MC. Differential fetal auditory reactivity as a function of stimulus characteristics and state. *Semin Perinatol*. 1989; 13:421–429. [PubMed: 2814528]
47. Hepper P, Scott D, Shahidullah S. *Journal of Perinatal and Neonatal Nursing*. *J Reprod Infant Psychol*. 1993; 11:47–155.
48. DeCasper AJ, Lecanuet JP, Busnel MC, Granier-Deferre C, Maugeais R. Fetal reactions to recurrent maternal speech. *Infant Behavior and Development*. 1994; 17:159–164.
49. Porter RH, Winberg J. Unique salience of maternal breast odors for newborn infants. *Neurosci Biobehav Rev*. 1999; 23:439–449. [PubMed: 9989430]
50. Porter RH. The biological significance of skin-to-skin contact and maternal odours. *Acta Paediatr*. 2004; 93:1560–12. [PubMed: 15841761]
51. Schaal B, Hummel T, Soussignan R. Olfaction in the fetal and premature infant: functional status and clinical implications. *Clin Perinatol*. 2004; 31:261–1585. vi–vii. [PubMed: 15289032]
52. Beauchamp GK, Mennella JA. Early flavor learning and its impact on later feeding behavior. *J Pediatr Gastroenterol Nutr*. 2009; 48(Suppl 1):S25–S30. [PubMed: 19214055]
53. Als H. Neurobehavioral organization of the newborn: opportunity for assessment and intervention. *NIDA Res Monogr*. 1991; 114:106–116. [PubMed: 1754009]
54. Udall JN Jr. Infant feeding: initiation, problems, approaches. *Curr Probl Pediatr Adolesc Health Care*. 2007; 37:374–399. [PubMed: 18053940]
55. McCain GC, Gartside PS, Greenberg JM, Lott JW. A feeding protocol for healthy preterm infants that shortens time to oral feeding. *J Pediatr*. 2001; 139:374–379. [PubMed: 11562616]
56. McGrath JM, Medoff-Cooper B. Alertness and feeding competence in extremely early born preterm infants. *Newborn and Infant Nursing Reviews*. 2002; 2:174–186.
57. McGrath JM, Braescu AV. State of the science: feeding readiness in the preterm infant. *J Perinat Neonatal Nurs*. 2004; 18:353–368. quiz 69–70. [PubMed: 15646306]
58. Clark L, Kennedy G, Pring T, Hird M. Improving bottle feeding in preterm infants: Investigating the elevated sidelying position. *Infant*. 2007; 3:154–158.
59. Dsilna A, Christensson K, Gustafsson AS, Lagercrantz H, Alfredsson L. Behavioral stress is affected by the mode of tube feeding in very low birth weight infants. *Clin J Pain*. 2008; 24:447–455. [PubMed: 18496310]
60. Mosca N. Holding premature infants during gavage feeding: Effect on apnea, bradycardia, oxygenation, gastric residual, gastrin, and behavioral state Case Western Reserve University. 1995
61. White-Traut RC, Berbaum ML, Lessen B, McFarlin B, Cardenas L. Feeding readiness in preterm infants: the relationship between preterm behavioral state and feeding readiness behaviors and efficiency during transition from gavage to oral feeding. *MCN Am J Matern Child Nurs*. 2005; 30:52–59. [PubMed: 15622150]
62. Eishima K. The analysis of sucking behaviour in newborn infants. *Early Hum Dev*. 1991; 27:163–173. [PubMed: 1802669]
63. Chang YJ, Lin CP, Lin YJ, Lin CH. Effects of single-hole and cross-cut nipple units on feeding efficiency and physiological parameters in premature infants. *J Nurs Res*. 2007; 15:215–223. [PubMed: 17806038]
64. Pridham KF, Schroeder M, Brown R, Clark R. The relationship of a mother's working model of feeding to her feeding behaviour. *J Adv Nurs*. 2001; 35:741–750. [PubMed: 11529976]

Figure 1.

Beginning at START, the SOFFI Bottle Feeding Algorithm guides the caregiver through a sequence of assessments, decisions, and actions to realize a safe, high quality infant feeding. Letters in the algorithm indicate identically lettered sections in *The SOFFI Reference Guides: Text, Algorithms, and Appendices: A Manualized Method for Quality Bottle Feedings*. (MK Philbin, ES Ross. Journal of Perinatal and Neonatal Nursing. 2011) “STOP” indicates ending or pausing a feeding to stabilize the infant. The algorithm is more easily followed in color and is available from the authors.

Figure 2.

Beginning at “Start, the SOFFI Efficiency; Flow Rate and Nipple Unit algorithm guides the caregiver through assessments, decisions, and actions to determine the nipple unit most compatible with the oromotor strength and coordination of an individual infant. The goal of the algorithm, as with all aspects of the SOFFI Method, is a comfortable, quality bottle feeding. This algorithm is accompanied by a narrative: Appendix I of *The SOFFI Reference Guides: Text, Algorithms, and Appendices: A Manualized Method for Quality Bottle Feedings*. MK Philbin and ES Ross, *Journal of Perinatal and Neonatal Nursing*. 2011. The algorithm is more easily followed in color and is available from the authors.

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The pacing technique leads the caregiver through a series of assessments, decisions, and actions to facilitate the infant's coordination of suck-swallow-breathe. A graduated series of levels leads the caregiver to the pacing method most suitable for an individual infant. The algorithm is accompanied by a narrative of the method in Appendix II of *The SOFFI Reference Guides: Text, Algorithms, and Appendices: A Manualized Method for Quality Bottle Feedings*. MK Philbin and ES Ross, Journal of Perinatal and Neonatal Nursing. 2011. The algorithm is more easily followed in color and is available from the authors.

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
GUIDE A-1 VISUAL ENVIRONMENT The eyes of preterm and term infants' are far more sensitive to light than adults and have less protection against it. ³⁸ Often apparently sleeping infants will open their eyes quickly if the light becomes quite dim. Feeding in bright light (normal NICU general lighting) requires effort defending against light that could go toward feeding.	Provide For infants < 32 weeks post menstrual age (PMA) adjust lights to dim when awake (to permit eye opening) and to near dark when asleep (to maintain biologically expected low light levels for visual development during sleep). When feeding turn the chair so that the infant faces into the darkest area and add a "scarf" or tent of dark or opaque material across the infant's head to make shade for the face. A dark shawl draped across your shoulder and the baby's head may also provide dim lighting needed. Add your own face to an interaction with care, watching for signs of physiologic or behavioral instability. ^{14, 39}	Avoid Avoid keeping light levels the same despite the infant's behavior (e.g., infant in the dark when awake or in the light when asleep). Avoid exposure (little or no shielding) to bright light (standard NICU lighting) during feeding. Avoid sitting so that brightly or strongly colored objects are in the line of sight as these cannot be escaped, and easily interfere with attention to feeding.
GUIDE A-2 AUDITORY ENVIRONMENT With multiple layers of acoustic protection, the fetus develops in quiet approximating a profound hearing loss. ^{40, 41} Even so, the second trimester preterm's hearing is acute and a NICU that is quiet to adults can challenge an infant's self-regulation. Improving quiet makes it easier for the infant to manage a feeding.	Provide To protect an infant from noise distraction and physical stress during feeding (and at other times as well) maintain sound levels in the NICU within Recommended Standards: typically about 45 dBA no more than 50 dBA about 10% of the time and rarely at 65 dBA for brief moments. ⁴² To minimize distractions and startles while feeding, place noise-generators outside the infant space: delivery carts, storage areas, travel paths, conversation/work areas. Maintain carts, sinks, etc. for quiet operation. Carefully govern personal noise production, conversation, etc. while feeding or while a nearby infant is feeding.	Avoid Laughing and talking on the phone are always louder than speaking directly to others. Avoid conditions that keep these sound sources and extended communication near the infant space. Discourage others from approaching you during a feeding. (Most messages can wait.) Avoid jumping in on others' conversations while feeding.
GUIDE A-3: VOICE Mother's voice is consistently and clearly heard in the second trimester. ⁴³ Features of the native language are learned then and mother's voice is recognized at preterm birth. ^{44, 45} Continued exposure to Mother's voice after birth is important for attachment and language development. Feeding is the universal occasion for mothers and infants to communicate with voice.	Provide During feeding, add face-to-face interaction with voice only as the infant becomes proficient and makes eye contact or shows other bids for engagement. Use a quiet voice that responds to the baby's physiology and behavior. Judge whether to continue if the infant looks away, breathes faster, or becomes fussy. Provide extensive opportunities for mothers to feed their infants and for infants to hear mother's voice in quiet conditions. Support mothers in using their own style and judgment about talking, singing, etc. However you may evaluate her speech and voice, this is the infant's primary source for acquiring language.	Avoid Avoid loud talking and group conversation in the infant area. Avoid looking away from the baby while feeding to talk to someone else. Avoid talking to the baby without responding to the physiology, movement, facial expression, or behavioral state. Avoid telling mother how or when to use her voice; how, what, or when to sing, etc. Avoid recorded speech or music during breast, bottle, or gavage feeding as the volume is difficult to control and the sound features and quality are often poor; infants know the difference between a voice recording and the real thing. ⁴⁶⁻⁴⁸ Recorded sound can become aversive teaching the infant to not attend to it.
GUIDE A-4 ODORANTS; THE ENVIRONMENT OF SCENT Infants use scent to identify their mother. ^{49, 50} Scent is important to attachment. Discrimination of maternal scent can be interrupted by scents that adults do not perceive as strong. ⁵¹	Provide For adults: Use unscented hair products, lotions, soaps, after shave, etc. when giving care. Ensure that hospital-provided adult-use soap, lotion, and alcohol rub are unscented. Completely dry alcohol rub before approaching the infant for a feeding. Separate strongly scented materials (e.g., alcohol swab) from feeding time as much as possible as it is aversive. For adults: Explain the rationale for protecting the baby from scents other than the mother's natural (unperfumed) scent. Place mother's breast pad near infant's face and change to fresh pads several times a day if possible as natural odorants become inactive rapidly. ⁵¹	Avoid For adults: Avoid perfume, after shave, scented lotions and hair products. Avoid (as much as possible) using alcohol wipes near or on the infant before or after feeding time. Avoid approaching the infant with moist alcohol rub on hands. For parents: Avoid failing to provide parents with information about deleterious effects of their perfumes, after shave lotions, etc. on the infant's ability to recognize the mother. Avoid telling a mother to put perfume on something she leave in the infant's bed as this will likely be aversive and covers whatever of her natural scent there may be.
GUIDE A-5	Provide	Avoid

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
GUSTATORY (TASTE) Taste is closely associated with feeding and part of the learned response to feeding. Preterm and term infants can discriminate among similar tastes and show preferences. ⁵²	Provide pleasant tastes (i.e., mother's milk or formula) with feeding. Place drops of milk/formula on infant's lips or fingers (for sucking) during gavage feeding. Separate unpleasant tastes from feeding (e.g., give vitamins between feedings without a milk vehicle and by gavage when possible). Separate unpleasant tastes from tasks involving the mouth; rinse gloved fingers in sterile water and dip in breast milk/formula before putting them in the infant's mouth.	Avoid combining unpleasant tastes with milk and feeding (e.g., putting vitamins in milk/formula). Avoid using flavored pacifiers as the "flavor" chemicals are untested and create a strong taste unrelated to milk. Avoid putting un-rinsed (milk, sterile water), gloved fingers directly in infant's mouth.
GUIDE A-6 GENERAL HANDLING AND TOUCH Preterm infants are very sensitive to handling. Abrupt handling is typically aversive. Handling can be disorganizing to physiology and behavior of preterm or ill infants.	Provide Announce your presence with quiet touch and voice before handling. Use gradually changing, smooth, slow movements before, during, and after feeding with a gradual off-on touch pressure. Support the whole body continuously during movement or turning. Adapt touch and handling to the infant's movement, facial expression, behavioral state or physiologic changes. For infants < 40 weeks PMA arrange or allow for a midline, semi-tucked position of the arms, legs, and spine with midline positioning of the head to facilitate oromotor skill.	Avoid When approaching an infant for a feeding, avoid touching/handling without warning. When changing a diaper, wrapping, etc. avoid abrupt, quick movements of the infant's body and rapid on and off touch pressure. Avoid supporting some body parts but not others (e.g., holding only head and buttocks). Avoid maintaining the adult task agenda for the feeding independent of the infant's movement, expression, behavioral state, or physiologic changes. Avoid prioritizing completion of a feeding over infant comfort and organization
GUIDE A-7 Experience with Hands-to-Mouth Self-Soothing & Sucking	When the infant is awake, help to bring hands-to-mouth for rooting and sucking practice, as tolerated. Position in sleep so that hands can be brought to mouth on awakening. Offer pacifier with milk tastes when infant is aroused and needs calming, or is alert and rooting.	Avoid Avoid restraining hands by swaddling them inside the blanket, placing nesting ties over them, or placing them inside a tight "nest".
GUIDE A-8 PLANNING & CONTROL A rested infant is more likely than a tired infant to maintain physiologic stability, motor tone and control, and state control for a successful feeding.	Provide Throughout the day prioritize essential tasks around feedings as much as possible so that essential tasks are planned for their effect on the infant's reserves for feeding. Minimally necessary tasks that make high demands can be postponed or eliminated if the infant's self-regulation is heavily challenged by higher priority tasks or the feeding itself. Consider the entire 24-hour day when estimating the effects of events (including routine tasks) on the energy and self-regulation needed for feeding. Spread tasks and stressful events across the day (not necessarily in "clusters") and perform them when the infant is awake. Novice feeders or those having difficulty maintaining self-regulation in many situations may tolerate only picking up (without re-swaddling or other activity) and immediately starting the feeding. Assist parents to learn to prioritize tasks by explaining the reasoning for your choices and planning.	Avoid Avoid thinking that the effects of routine tasks (physical stress, pain, etc.) are separate from or do not affect competence in feeding. Avoid a series of routine care activities immediately before a feeding until the infant maintains all-round self-regulation during the tasks with surplus energy and organization for the feeding. Avoid adding tasks or procedures to an existing bundle/cluster without evaluating their cumulative effects on the baby. Avoid an uninterrupted series of clearly stressful procedures "to get it over with so he can rest" as the recovery time may be longer than the time between feedings. Avoid completing parent's care activities before they arrive. Avoid leaving parents alone while giving care until they have mastered the skill of planning with the effect on the infant as the primary consideration.
GUIDE A-9 PREPARATION FOR A FEEDING Thorough preparation provides the caregiver with better concentration, less unrelated movement, and the infant with a predictable sequence of events, facilitating learning. A well-fitting chair and foot stool support	Provide Organize equipment and the environment before touching the infant or opening the incubator (e.g., locate a comfortable chair, and foot stool). Adjust lighting or turn the chair to reduce light in the infant's eyes. Clear a flat surface. Lower monitor alarm levels if possible. Bring all items to a place within easy reach during the feeding. Arrange for someone else to answer calls or check monitor alarms. Help parents prepare for a feeding, setting up feeding materials as	Avoid Avoid an incomplete set-up of materials and the environment before starting the feeding. Avoid a disjointed, start-stop series of activities after touching the infant. Avoid using whatever chair that is available even if it is uncomfortable for you or the parent. Avoid answering the phone or pager during feeding. Avoid a staff tradition that requires getting up during a feeding to check on another infant. Avoid leaving parents to set

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
aligned body mechanics, concentration, and more secure holding.	needed so that they can eventually become independent with feeding.	up for the feeding on their own until they indicate a wish to do so.
GUIDE B ASSESSING STABILITY	ASSESS INFANT: INDICATORS OF STABILITY ADAPTED from Als ⁵³	ASSESS INFANT: INDICATORS OF INSTABILITY ADAPTED from Als ⁵³
GUIDE B-1 HEART RATE An indicator of physiologic stability	Stability Heart rate (HR) stable within 20% above or below the average of recent resting HRs and within the unit- based standard for limits, or within the individual standard for the infant.	Instability Heart rate above or below the resting limits or standards for the unit or baby.
GUIDE B-2 SKIN COLOR An indicator of autonomic system regulation	Stability Color across face and body is pink or mildly pale. Color remains stable.	Instability Color across face and body is pale, flushed/ red, dusky (circumoral, orbital, elsewhere across the face), or mottled (network of veins apparent). Skin areas alternate between pale and dusky. Color has changed from pink or mildly pale.
GUIDE B-3 RESPIRATORY & BLOOD OXYGEN A stable respiratory rate and blood oxygen levels are necessary for coordinated suck-swallow-breathe. ⁵⁴	Stability Respiratory rate (RR) within 20% above or below the average of recent resting RRs or within the unit- based or individual standard for limits. Regular breath-to-breath intervals; absence of pauses longer than 5 seconds between breaths. Blood oxygen levels stable; above the lower limit determined for this baby.	Instability RR outside unit-based or individual limits, irregular breath-to-breath intervals, pauses greater than 5 seconds between breaths, gasping, yawning, coughing, hiccupping, retractions, stridor, nasal flaring, increased effort of breathing, puffing/huffing motions, expiratory grunt. Blood oxygen levels (i.e. desaturations) below the lower limit for the particular infant.
GUIDE B-4 GASTROINTESTINAL Retaining and digesting a feeding requires a stable gastro-intestinal system. ⁵⁴	Stability Uneventful digestion after recent feedings: stomach emptying between feedings, soft belly between feedings, regular elimination patterns. Small spit up, if any.	Instability Diarrhea or constipation, substantial spit up, gagging, showing signs of discomfort during or after feeding eating (e.g. intervals of squirming, face shows distress), not emptying stomach between feedings, feeding intolerance.
GUIDE B-5 BEHAVIORAL STATE, STATE STABILITY Infants feed more successfully in drowsy or awake behavioral states and with behavior state stability. ⁵⁵⁻⁵⁷	Stability Clearly differentiated behavioral states. Gradual changes from one state to another. Fussing or crying stops with minimal caregiver assistance. For feeding, a somewhat drowsy or alert state or arousal to a drowsy or alert state with simple handling. For infants with bronchopulmonary dysplasia (BPD)/chronic lung disease (CLD) successful feeding is possible with a skillful caregiver following a highly individualized plan even though behavior states are less clear, change more rapidly, and require more inclusive or longer assistance to calm from crying.	Instability Very unclear behavioral states (e.g. asleep or awake?). Rapid changes from one state to another (e.g., sudden onset of fussing, sudden sleep); prolonged fussing or crying; difficult to calm or console from crying or fussing. When determining readiness to feed, use the same definition of state for all infants, including those with BPD/CLD.
GUIDE B-6 MOTOR (MOVEMENT) AND TONE Good tone stabilizes the body for feeding. In face and neck it enables efficient suck- swallow- breathe. ⁵⁴	Stability Good tone (neither flaccid nor stiff) as indicated by moderate flexion in upper and lower extremities, neck, and trunk. Smooth, purposeful movements of extremities. Predominant midline position at rest; few tremors.	Instability Generally flaccid or limp; sagging in face, body, or extremities; rigid or tight in face, body or extremities. Arching the neck and spine. Attempts to block face with hand or arm; turning head away from the caregiver when held in feeding position. Flailing or jerky movements or multiple tremors.
GUIDE C STABILIZING & REORGANIZING FEEDING IS DEFERRED OR STOPPED	STABILIZING AND REORGANIZING AFTER DECREASED SELF-REGULATION FEEDING IS DEFERRED OR STOPPED	BARRIERS TO STABILIZING AND REORGANIZING FEEDING IS DEFERRED OR STOPPED
GUIDE C-1 REST BREAK A period of minimal stimulation supports the infant's efforts to regain self- regulation and feed more successfully afterward.	Stability Stop the activity of the moment (e.g., feeding, readjusting position). Observe the infant closely making small to moderate adjustments in body position for increased	Instability Avoid continuing the activity of the moment (e.g., readjusting position, feeding). Avoid looking around or talking to others. Avoid rocking the infant in a chair, bouncing on

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
	comfort (e.g., reduce angle of trunk flexion; tip bottle down to stop the flow). Hold the baby still (e.g., cease rocking in chair, bouncing baby's body in arms or with own leg movement.)	knees or in arms. Avoid large position changes or increased handling (e.g., re-wrapping). Avoid actively burping.
GUIDE C-2 ENVIRONMENTAL STIMULATION External stimulation adds to disorganization / loss of self-regulation. It burdens efforts at reestablishing self-regulation.	Stability To the extent possible, make changes to create an environment that is less stimulating (e.g., shield eyes from light.) Cease talking and engaging in other activities (Guide A: General Conditions Supporting Stability)	Instability Avoid maintaining the current level of environmental stimulation (e.g., brightly lit, noisy, adult conversation and activity near the infant.) (Guide A: General Conditions Supporting Stability)
GUIDE C-3 STABILIZING BODY POSITION RECOVERING FROM MOTOR DISORGANIZATION Disorganized movement, flailing, arched posture, etc. prevent state organization and increase likelihood of physiologic disorganization (e.g., increased HR, RR). ³⁴	Stability Wrap a flailing or crying infant carefully with extremities in midline and shoulders & feet supported by a wrapped blanket. Hand swaddle (Guide C-7) – OR – surround infant with flexible nesting materials allowing room for movement with feet braced. Continue hand swaddling until self-regulation has returned to baseline. Hand-swaddle arms and legs during care or feeding if infant shows physiologic or behavioral disorganization. Alter position as needed (e.g., to side-lying) ⁵⁸ to locate position of comfort.	Instability Avoid wrapping tightly, because while the baby may stop moving, this may indicate giving up an attempt at self management or self-comforting. Avoid placing an infant inside either a tight, confining nest or one so long that the feet cannot reach to foot end (i.e., no foot brace available). Avoid wrapping too loosely to provide containment (e.g., leaving feet outside the wrap.) Avoid placing on a flat surface (the bed, the scale) with no containment. Avoid leaving an unsettled baby alone.
GUIDE C-4 STABILIZING BEHAVIORAL STATE A stable drowsy or alert behavioral state enables comfortable, efficient feeding by permitting enlistment of multiple self-regulatory mechanisms that are not generally available in sleep, and is more likely to lead to successful bottle feeding. ^{55, 56}	Stability Calm from crying or cry face, jerky or flailing movement or efforts to escape the bottle (e.g., turning head away, arching neck or back). Remove bottle. Employ other strategies described in Guide C. If infant is asleep (as opposed to drowsy), gently burp, as necessary, and return to bed without rousing if possible. Infants with BPD/CLD often have difficulty re-organizing behavioral state from sleep to an awake or drowsy state, and difficulty calming from crying and arching. Consistent caregivers (who know infant well), patience, and skill may be required.	Barrier - Instability Avoid ignoring infant attempts to escape the bottle (turning head away, arching neck and/or back). Avoid trying to make the baby feed when fussing, crying, or sleeping. Avoid not providing support for motor reorganization if the infant is arching or extending neck or back, flailing, showing other signs of disorganization. Avoid wakening a sleeping infant. Avoid leaving infants with BPD (or otherwise unstable) essentially on their own to calm from crying (e.g., in a swing)
GUIDE C-5 STABILIZING PHYSIOLOGY Improved physiologic stability usually follows from regaining behavioral state and motor disorganization	Stability Physiologic stability is usually supported by regaining motor control (e.g., from squirming, flailing, arching, etc.) and improving body position (e.g., to increase comfort). As well as regaining state organization (e.g., calming from fussing or crying to a sleep state or alert state). Depending on the infant's underlying physiology, the time required for regaining physiologic stability will vary from 1 to 10 or 15 minutes after state and motor systems are reorganized. Infants with BPD/CLD usually require more time and care than other infants due to difficulties with air exchange while distressed and consequent oxygen debt as well as their typical habits of prolonged crying, arched posture, etc. If increased oxygen support is required, decrease it as soon as possible.	Instability Avoid increasing oxygen concentration or flow as a first or only strategy for re-establishing physiologic stability without considering the effort exerted by the infant. Avoid considering physiologic instability as unrelated to state and motor instability. Avoid not attending to disorganized behavioral states and movement when the infant is physiological instable.
GUIDE C-6 PACIFIER, NON-NUTRITIVE SUCKING A pacifier is a strong stimulus the infant usually cannot override and must respond to by sucking. Sucking can distract from crying/fussing, permitting faster state reorganization. However, forcing a pacifier into the mouth is aversive and contributes to	Stability If the infant has difficulty settling, offer pacifier by brushing it against lips or cheek. Wait for infant to show an interest by mouthing or searching for it or opening mouth somewhat. Gently insert pacifier and withdraw if infant shows resistance with	Instability Avoid forcing a pacifier into the mouth as a means of stopping crying or distress movements. Avoid keeping it in place with objects or blankets. Avoid putting milk on a pacifier if an infant is upset, crying (i.e.,

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
associating feeding (nipple in mouth, sucking) with aversive experience.	tongue, gagging, facial expression, turning head, etc.	avoid creating an association between milk and discomfort.)
Guide C-7 Hand Swaddling Hand swaddling is effective across all ages of neonate and nearly all acuity levels.	Stability See Hand Swaddling, below. If an infant is disorganized, crying, or otherwise too aroused to feed, hand swaddling either in arms or in bed is often effective in assisting the infant to regain self-regulation via attaining motor control. Although newly born, acutely unstable, and early gestation infants who are reactive to touch would not be bottle feeding, it is recognized that hand swaddling may be useful to these infants only by skilled staff or by parents if limited to light, still head and foot touch.	Instability Avoid pushing or putting pressure on the infant's extremities, trunk, etc. so that movement is restricted. Assiduously avoid using hand swaddling for restraint. Or as a means of forced positioning. Avoid swaddling some extremities and not others if they are also flailing or in need of support. Avoid removing the hands until the infant can maintain motor control without it. Avoid quickly removing hands as the sudden change in pressure is arousing.
Hand Swaddling Purpose and Method The purpose and method of hand swaddling appear to be often misunderstood as a way to help an infant to regain control by stopping his movement and securing his body in a desirable body position. Unfortunately, this is not hand swaddling but, rather, restraint. As hand swaddling is a particularly useful means of supporting an infant who is too distressed to feed, the method is described here in some detail.		
The purpose of hand swaddling is to assist the infant to <u>gain control</u> of movement, NOT to prevent movement. With this goal in place, hand swaddling has several distinct uses.		
First, hand swaddling is a gentle assist in controlling or directing movement of arms and legs. For an infant in a very disorganized (uncontrolled), crying/ flailing state (Brazelton/Als behavioral states 5 or 6) hand swaddling is done by gently cupping hands over the space bounded by arm and leg extensions and gradually reducing that boundary in the direction of the flexions. Initially, the hands provide a firm, resilient, "wall" that lightly limits flexion without pushing. With that as a first external limit (or control, or foundation) the infant gains increased control of flexion, eventually using the hand-wall to direct flexion by more purposefully pushing against it. The force of extensions may come under control after their direction). With increased control and smaller extensions, the hand- wall boundary becomes smaller allowing the infant to reach it without having to turn to greater extension. One can feel the return of control as the touch of a foot or arm becomes less like a random "kick" or "swat" and more like a directed "push off". With the gradual return of motor control, behavior state control is more attainable. It is important to maintain a light hands-on conclusion until the infant can maintain behavioral stability without it. To test this, remove the hands slowly and observe the infant for a full minute. A tired infant may fall asleep (behavioral states 2 or 1) if the hand swaddling is skillful and the infant otherwise comfortable. After removing the hands, a light cloth may be sufficient as a touch, kinesthetic reminder of the movement boundaries and help sustain control.		
Hand swaddling is also used to direct the ineffective movement of a more organized (self-controlled) infant. An example would be gently directing jerky top arm extensions of a side-lying infant toward midline. In this case the adult's other hand might be lightly placed on the infant's head or trunk.		
In all uses of hand swaddling for disregulated movements, it is important that the hands DO NOT PUSH on legs or arms, but rather gently follow the infant's lead in the speed and direction of the closing boundary. Pushing is counterproductive because it adds a further stressor, elicits a natural counter-push or more vigorous extension, and overrides the infant's efforts to attain the flexed position of comfort. Pushing extremities into contact with the trunk may result in the appearance of a calm infant, but if the hands are removed the infant's uncontrolled movements generally pop back. Similarly, forcibly putting the infant in a too-confining and obscuring blanket "boundary" conceals squirming resistance, not relaxation.		
Hand swaddling also takes the form of a surrounding light touch to assist with relaxation or provide the comfort needed for asleep. This may be as limited as hands on head and foot or, surprising to some, only on the ball of a foot.		
Parents may be particularly effective in this touch relaxation as they are focused on the infant's comfort and generally have time to stay "hands on" as long as the infant needs it.		
GUIDE D GAVAGE	GAVAGE FEEDING: IF INFANT IS TOO UNSTABLE TO FEED BY BOTTLE	AVOID UNPLEASANT EXPERIENCE ASSOCIATED WITH FEEDING BY GAVAGE
Guide D-1 Inserting Tube	Provide Dip gavage tube into milk prior to inserting into baby's mouth. Insert gavage tube slowly, allowing infant to suck the tube down.	Avoid Avoid inserting tube rapidly or while infant protests or gags.
Guide D-2 Positive Experience of Taste & Smell	Provide Provide tasting and smelling milk/formula by putting a drop of milk on a pacifier or the baby's fingers to suck. Parents can use their own, ungloved finger with a drop of milk. Rinse gloves in sterile water then dip fingers in milk/formula, shaking off the excess.	Avoid Avoid missed opportunities to make the gavage experience less stressful. Avoid excluding parents from participating in gavage placement possibly by hand swaddling. Avoid wearing gloves that have not been rinsed in sterile water or milk/ formula.

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Guide D-3 Time Allowed for Gavage Feeding	Provide Use a feeding pump over 20 to 30 minutes so that the stomach expands slowly. A rapid infusion rate of a feeding is associated with increased behavioral signs of discomfort. ⁵⁹	Avoid Avoid feeding by gravity as the rate tends to be fast causing the stomach to hurt from expanding too quickly. In addition to discomfort, rapid stomach stretching is an aversive experience associated with feeding.
Guide D-4 Bodily Comfort and Secure Support	Provide Hold the infant during gavage feedings, as tolerated. ⁶⁰ If holding is not tolerated use light hand swaddling during the feeding. See item C-7. If blanket swaddling is needed see item G-2 for method.	Avoid Avoid gavage feeding when the infant is in bed with little or no support (e.g., side-lying without secure back support; a blanket or commercial “boundary” that is too long or wide to provide stabilizing boundaries or so tight fitting that it limits movement.) Avoid advising parents to keep away/not touch their infant during gavage. Avoid leaving an infant alone during a gavage feeding as this prevents knowing if the infant becomes uncomfortable; and because it is not safe.
Guide D-5 Non-stimulating Environment	See Guide A: General Conditions Supporting Stability	See Guide A: General Conditions Interfering with Stability
GUIDE E READINESS TO FEED, WHILE UNDISTURBED	INDICATORS OF READINESS TO FEED WHILE UNDISTURBED	INDICATORS OF NOT BEING READY TO FEED WHILE UNDISTURBED
Guide E-1 Movement	Ready General stirring (movement of extremities and head); moving hands onto face or mouth; moving the face against bed linens or hands; mouthing or sucking movements.	Not Ready Very little or no facial movement; very little or no movement of extremities or trunk; shallow, irregular breathing
Guide E-2 Behavioral State Crying from hunger indicates readiness to feed but increases the difficulty of feeding with necessary self- regulation, raises heart and respiratory rates, and wastes energy. It is nearly always preceded by earlier signs of hunger.	Ready Light sleep, drowsy, or awake. Mild fussing from hunger that is calmed with holding and preparations to feed. Begin feeding before an infant is crying from hunger. However, if more subtle feeding cues are missed, calm a crying baby before starting to feed (e.g. with holding, movement /gentle vestibular stimulation, pacifier, etc.) Stabilize infant as needed (Guide C: Stabilizing / Reinstating Stability/ Calming)	Not Ready Infant is asleep. Avoid vigorously stimulating a sleeping infant to awaken in order to feed. Avoid starting to feed an infant that is sleeping (rather than drowsy). Avoid waiting until the exactly scheduled feeding time if the infant is clearly hungry before then. Avoid feeding a crying infant.
GUIDE F Readiness: Held in Arms	INDICATORS OF READINESS TO FEED WHEN HELD IN ARMS WITH NON-NUTRITIVE SUCKING	INDICATORS OF BEING UNPREPARED TO FEED WHEN HELD IN ARMS WITH NON-NUTRITIVE SUCKING
Guide F-1 Approaching the Infant	Ready Whether drowsy or awake, approach the infant by first providing an “acoustic distance alerting” of a few moments of quiet speech directed to the baby. This is followed by the “proximal alerting” of a light hand swaddle or light touch on head and body while speech is continued. These “alerts” use natural biological functions to ready all systems for an event. ⁶¹	Not Ready Avoid activity that arouses an infant suddenly (e.g., abrupt touching, handling) or that elicits a startle.
Guide F-2 Holding in Arms	Ready Wrap infant securely (not tightly) with extremities flexed in midline, shoulders and back of head supported inside the blanket, and hands near face/mouth as infant’s own movement indicates. Hold infant in arms.	Not Ready Avoid omitting this assessment. The infant is <u>not ready</u> to feed if he remains asleep OR becomes unstable OR does not take the pacifier voluntarily OR if sucking is weak and intermittent. Avoid pushing the pacifier in the infant’s mouth or inserting it when mouth is open (as in a yawn) but infant is not showing interest in it. Avoid picking up a sleeping baby and stimulating to an awake state in order to start a feeding. Avoid advising parents to initiate a feeding by these methods

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Guide F-3 Offer pacifier and Observe	Ready Offer pacifier by brushing it against lips or cheek (to elicit rooting). Wait for infant to show interest (turn toward, mouthing movement, opening mouth) or accept the pacifier.	Not Ready Avoid forcing pacifier into the infant's mouth. Avoid considering the infant ready to feed even if the pacifier is not accepted voluntarily
Guide F-4 Assess Ability and Readiness	The infant is ready to feed if he attains or maintains a drowsy or awake behavioral state AND maintains physiologic stability AND shows spontaneous interest in the pacifier, AND if sucks vigorously in a series of sucking bursts and pauses.	The infant is not ready to feed if he remains asleep OR becomes unstable OR does not take the pacifier voluntarily OR if sucking is weak and intermittent. Avoid pushing the pacifier in the infant's mouth or inserting it when mouth is open (as in a yawn) but infant is not showing interest in it.
GUIDE G Feeding by Bottle	PREPARATION AND ACTIONS FOR A SUCCESSFUL BOTTLE FEEDING	ILL ADVISED PREPARATIONS AND ACTIONS FOR A BOTTLE FEEDING
Guide G-1 General Preparation	See Guide A : General Conditions Supporting Stability	See Guide A: General Conditions Supporting Stability
Guide G-2 Stable Body Position Competent feeding requires stable, forward flexion of the shoulders and of the extremities and stable control of neck and head with face at the midline. Without this positional and movement control, the infant wastes energy attempting to achieve balance and stability. There is also increased possibility of choking, and incompetent feeding as neck and head position are closely involved in suck-swallow-breathe coordination. ¹⁰	Provide If self-support as described here is not possible, a swaddling blanket is used to provide it externally. It is folded around the infant to support the shoulders and head (at the occiput) in a neutral to slightly flexed position; head and neck are aligned with the midline of the chest. Arms are positioned slightly forward (by the forward-flexed shoulder) so that the hands are free to locate their position of comfort near or on the face. Feet are stabilized with snug containment in the blanket by pulling the "foot" corner up across the body first and securing it with the right and left corners. In addition a pillow may be used to support the infant's entire body comfortably and to maintain the comfort and relaxation of the person providing the feeding. Reduce or withdraw supports over days as the infant achieves self-supporting abilities. During feeding support head and shoulders ON your arm.	Avoid Avoid swaddling each infant's body position in the same way without individualizing to the needs of the infant. Avoid wrapping the baby loosely (or not at all) so that shoulders and head are not supported or the feet hang out. Avoid keeping the hands away from the mouth by wrapping them tightly inside the blanket with arms extended at the side as this restraint makes the baby uncomfortable and detracts from competent feeding when the baby fights against it. Restraining hands away from the face interferes with the development of face- hand coordination which later evolves to eye-hand coordination. Avoid resting the infant's <u>neck</u> on your arm. This causes neck extension (and possibly shoulder/scapular extension) and increases potential for choking/ coughing and defensive, disorganized oromotor behavior. Avoid grasping the infant's neck or base of skull to maintain head position. This eliminates infant's ability to turn away/ escape the bottle.
Guide G-3 Comfort of the Person Providing the Feeding The adult must be comfortable and able to relax with good posture. The arm must be supported so that the spine is not bending to the side (i.e., not having to lean over to reach the chair arm. A comfortable, relaxed person is better able to focus on the infant and will be less likely to develop habits of seating that interfere with holding the baby in the best position for feeding.	Provide Seating for the person providing the feeding requires comfortable back and arm support and the ability to sit with erect posture. A footstool often increases comfort by stabilizing legs and trunk. Lighting should enable seeing detail without being so bright that infant cannot open eyes or squints. A shading device for the infant's face may be necessary if bright light is required.	Avoid Avoid using whatever chair is available, including using an armless chair or one with arm supports lower than the functional height of the elbow. Avoid minimizing the effect of your comfort on the success of the feeding. Avoid a chair that causes you to slouch.
Guide G-4 Holding for a Feeding	Provide Hold infant in arms if possible or near the body while supporting the infant's head. Hold the infant's head if necessary so that he can easily turn away and the head and neck remain under the baby's control. Hold infant in a semi-upright position or possibly in side-lying; maintain head at least 45-60 degrees above hips and not more than 90 degrees. Hold so that your own hand or a finger is on the infant's back to help count breaths if respirations are not easily observed otherwise.	Avoid Avoid holding the infant's head in a fixed position usually at the back of the neck/ occipital area (the Spock grip) in order that he cannot turn away from the bottle. This interferes with the infant developing control of head and neck. This is often used as a means of preventing the infant from escaping or avoiding the nipple – aversive experiences associated with feeding.

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Guide G-5 Inserting Nipple	Provide Brush the nipple across the infant's lips or cheeks to elicit a rooting reflex. With a young preterm infant the rooting response may consist of a brief parting of the lips. A quick response is needed in order to insert the nipple during the rooting reflex when the oral-motor system is expecting it.	Avoid Avoid pushing the nipple into the infant's mouth as the oral-motor system is not prepared for managing a bolus and the infant is more likely to employ uncoordinated feeding movements and to choke. Likewise avoid inserting the nipple when the infant is yawning or otherwise has the mouth open but is not expecting a nipple.
Guide G-6 Assess Stability	See Guide B: Assess Stability	See Guide B: Assess Stability
GUIDE H PARTICIPATION	INDICATORS OF ACTIVE PARTICIPATION IN THE FEEDING	INDICATORS THAT THE INFANT IS NOT PARTICIPATING IN THE FEEDING
Guide H-1 Stable Physiology	Participating All signs of stable physiology are present. See Guide B: Indicators of Stability: Physiologic Stability.	Not Participating One or more signs of stable physiology are absent. See Guide B: Indicators of Stability: Physiologic Stability.
Guide H-2 Behavioral State	Participating Infant is drowsy or awake. See Guide B: Indicators of Stability: Behavioral State	Not Participating Infant is fussing, crying, or clearly sleeping. Avoid arousing an infant from a deep sleep during a feeding to make the infant continue sucking. See Guide B: Indicators of Stability: Behavioral State
Guide H-3 Movement and Tone	Participating Infant has good tone in extremities, trunk, neck, and face. Infant maintains a seal around the nipple (assuming that correct nipple has been determined.)	Not Participating Infant has low tone in extremities and trunk (i.e., limp, hanging, flaccid.) Infant has low tone in neck and face (i.e., head flops to side or back if not supported, lower face appears to sag, mouth is slack, and the tongue does not maintain a seal around the nipple.)
Guide H-4: Spontaneous Sucking	Participating Infant sucks spontaneously with pauses after short sucking bursts and re-starts sucking independently. Infant restarts sucking spontaneously after a burp. See Guide H: Efficiency	Not Participating Infant stops sucking and restarts only with stimulation inside the mouth. Infant remains asleep through and after a burp. Infant remains asleep despite efforts to arouse by stimulating (e.g., unwrapping changing position, etc)
Guide I EFFICIENCY SEE Figure 2: FLOW RATE NIPPLE UNIT SELECTION	INDICATORS OF EFFICIENCY See Appendix A: NIPPLE UNIT CHARACTERISTICS AND FLOW RATES	INDICATORS OF INEFFICIENCY See Appendix A: NIPPLE UNIT CHARACTERISTICS AND FLOW RATES
Guide I-1 Suck-Swallow-Breathe Pattern with Fluid in Bottle	Infant maintains integrated compression and suction throughout the feeding. Infant maintains a pattern of 3-5 suck-swallows followed by a breath (can be a short catch breath) with an occasional long pause (for catch up breathing or rest). The longer pause is followed by a self-initiated return to sucking in a pattern of a short series of suck-swallow bursts and brief pauses for breathing. Minimal or no milk/formula is seen around the edge of the nipple	Flow may be too fast if an infant uses integrated compression/suction with the pacifier but only compression with the bottle nipple. Flow may be too fast if more than 3-5 sucks occur with no pause to breathe. Flow may be too fast if milk/formula drools or dribbles around the nipple. ^{62, 63}
Guide I-2 Maintaining Energy	Having Success Infant maintains drowsy or awake state through the feeding with active participation (See Guide G: Participation)	Having Difficulty A slower flow nipple (and extra support) may be needed if the infant begins a feeding with stability (physiology, state, and motor) but loses it (Guide B: Indicators of Stability: Physiologic Stability), or cannot maintain suck- swallow and breathe. ^{62, 63} (See Guide C: Stabilizing)
Guide I-3	Having Success	Having Difficulty

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
Amount of Intake	Infant ingests an appropriate amount of milk/formula, finishing in a drowsy or sleeping state with good tone and stable physiology.	Flow may be too fast if the infant stops feeding or falls asleep before achieving an appropriate intake. ⁶³
Guide J Summary	<p>See SOFFI Method Pacing Algorithm and Appendix B: SOFFI Method Pacing Technique</p> <p>Preterm infants learning to feed use a pattern of successive suck bursts and pauses. Observe and count breaths as the infant sucks. Mature sucking integrates breathing within the sucking burst. After 3-5 sucks with no breath, use techniques in Appendix B: SOFFI Method Pacing Techniques. Observe for subtle signs of needing a rest break (e.g., dropping from alert to drowsy, loss of tone.) Allow infant to determine the length of the rest - which can seem to be long to the caregiver (e.g. 1-2 min.)</p>	<p>Avoid</p> <p>Avoid removing the nipple only if the baby coughs or chokes. Avoid restarting sucking when the baby pauses by moving the nipple in his mouth (e.g., moving up and down, pulling outward and pushing inward, twirling the nipple inside the mouth). Avoid continuing to make infant suck if the pace becomes very slow or the baby falls asleep or gets floppy before taking the expected amount. Avoid arousing the baby intentionally (e.g., remove the swaddling blanket, "burping" by "patting" the back or rubbing it vigorously, talking loudly, changing baby's position several times in quick succession.) Avoid continuing to feed if vital signs are not within established parameters.</p>
GUIDE K: Care by Parents		
<p>Guide K-1 Inclusive Interactions with Parents</p> <p>Among all NICU professionals, bedside nurses are in the best position to include parents in all aspects of their infant's care. Consistent efforts to include parents in care sets the conditions for achieving competence in feeding and confidence in themselves as parents of this preterm, ill, or fragile infant.</p>	<p>Provide</p> <p>Assist parents in gaining competence with early inclusion of their participation in care, even if this is a very simple action such as adjusting an eye covering for light therapy, or containing a hand while the infant is repositioned. Look for and set up opportunities for parents to work with you at their skill level. Gradually increase their participation so that they are competent in their care and confident in themselves when the infant is ready to bottle feed. For parent's with problematic interaction behaviors, seek assistance from available resources and cooperate in developing a staff-wide approach to reducing the unwanted behavior. Approach examples might be: talking with them just as any other parent with adjustments for their level of comfort; being courteous and polite in all things; calling them with updates at a staff- determined frequency.</p>	<p>Avoid</p> <p>Avoid separating parents and infants by telling parents that their baby is too tired to be with them (e.g., "He's too tired to talk to.") This conveys that, as the child's parents, they are not important to the infant's welfare or competent enough to perform the most minimal of functions. Avoid evading parents by completing care that they could do before they arrive. Avoid social or unnecessary professional talk in the parent's space as this conveys that they do not belong and are not worth the consideration of doing business elsewhere. Avoid withdrawing from parent's with problematic interaction behaviors.</p>
<p>Guide K-2 Experience with Bottle Feeding</p> <p>It is important for parents to be competent in their abilities and confident in their judgments coming into the central arena of feeding. Parents who regard themselves as competent are more confident and their infants are less likely to develop feeding problems during the first year.⁶⁴ They are also more likely to develop rewarding, mutually responsive relationships.²⁰</p>	<p>Address this complex task in a step-by-step manner. Make arrangements with others to prevent an infant from crying for more than a few minutes. Stay at the parent's side during caregiving and feeding until the parent completes the task in a thoroughly competent manner. Help families achieve rewarding social interaction with their infant. Show infant behavior that indicates alertness (e.g., does not appear as alert as a term baby; may appear to "look through" rather than at them; tires easily or falls asleep after brief face-to-face interaction; interaction alternates with closed eyes and disengagement.) Help families recognize behaviors showing fatigue (e.g., fussing, squirming, turning head away, sleeping). Help families support the baby's efforts at interaction (e.g., quieting their own voices, containing their own excitement, handling slowly and smoothly; providing rest periods.) Help families set limits with friends and relatives for visiting, holding, talking loudly, etc.</p>	<p>Avoid</p> <p>Avoid leaving parents alone with their infant until they are skillful and confident in their abilities. Avoid asking parents if it is OK to leave, as the expected answer is "yes".</p>
Guide K-3 The Bedside Nurse Sets the Standard	Provide	Avoid

GUIDE A ENVIRONMENT	PREPARATIONS FOR FEEDING GENERAL CONDITIONS SUPPORTING STABILITY	PREPARATIONS FOR FEEDING GENERAL CONDITIONS CHALLENGING STABILITY
<p>Nurses have high status in the realm of hands-on care of a preterm, ill, or fragile infant. Parents observe nurses closely in learning how to do something “right”. The nurse’s behaviors, conversation, and deportment set the standard for the “right” way, whether or not the nurse wants the behavior to be emulated.</p>	<p>Provide a good example for all parents (e.g., those perhaps observing at a distance) of feeding infants sensitively and knowledgeably. Use the parents’ preferred name for the infant; Incorporate parents’ ideas about feeding to the extent possible; Stay seated beside a parent during early feedings focusing only on the feeding. Narrate (identify and describe) briefly and quietly in real time how a particular skill/behavior of the mother is helping the infant.²⁰ As each feeding concludes, describe at least one good feature of the parent’s efforts, however small.²⁰ Adjust the infant’s schedule to suit the parents’ schedules; Work with hospital and community supports (i.e., social workers, Part C personnel) to find resources for families to get to the hospital for feeding.</p>	<p>Avoid ignoring that all parents in the area are learning by observing you during a feeding; Avoid unintended expressions of power (e.g., calling the infant “my baby”, referring to the infant him by staff-invented nicknames.) Avoid interrupting parents concentration while feeding (e.g., discussing other matters, chatting.) Avoid taking over feeding an infant who is having difficulty rather than supporting parents to feed. Avoid directing attention to yourself as the teacher rather than directing attention to the infant as the source of information.</p>