

Protocol #3

Signs of Effective Breastfeeding



Protocol #3: Signs of Effective Breastfeeding

Effective latching, positioning and sucking are keys for successful breastfeeding.

Observation and Assessment

1. Assess and teach the mother how to recognize that her baby is ready for breastfeeding.

Early Feeding Cues:

- Rapid eye movements under the eyelids.
- Soft cooing or sighing sounds.
- Sucking or licking movements.
- Sucking sounds.
- Restlessness.
- Hand-to-mouth movements.

(Adapted from ILCA, 2005)

2. Assess and teach the mother how to recognize that her baby is sucking effectively. Mother is able to observe for signs of breast milk transfer. See also Point 5.

Deep and Slow Sucks:

- At the beginning of the breastfeeding the infant may have shallow and quick sucks that help to stimulate the letdown or breast milk ejection reflex. When letdown occurs, the breast milk flows and the suck pattern changes, becoming deep and slow. There is a pause during the suck when the infant's mouth opens the widest. Once the breast milk flows there

should be deep and slow sucks (open-pause-close), with swallows occurring on every suck to every other suck throughout most of the breastfeeding. See the *Suck Cycle* and diagrams.

While Sucking:

- Mother and baby maintain an effective latch and a comfortable position (*Protocol #2: Positioning and Latching*).
- Mother feels her breast being pulled, with no pain.
- Baby has wide-open mouth.
- Baby sucks, swallows, and breathes in a rhythmic and co-ordinated pattern.
- Baby makes swallowing sounds (e.g., a quietly exhaled “kaa, kaa, kaa”, not clicking or smacking sounds).
- With a small breast milk volume, such as colostrum, swallowing may only be palpable on the baby's throat (Smillie, 2005).
- Baby is able to maintain the latch and the mouth does not slip off the mother's breast.



Mouth opening



**Pause when mouth
is opened the widest**



Mouth closing

3. Assess and teach the mother about adequate output:

Baby's Age	Wet Diapers Each Day	Stools Each Day
1 day old	At least 1 wet diaper (a wet diaper feels like at least 2 tablespoons or 30 ml of water poured on a dry diaper).	At least 1–2 sticky dark green/black stools (meconium).
2 days old	At least 2 wet diapers.	At least 1–2 sticky dark green/black stools (meconium).
3 days old	At least 3 heavy wet diapers (a heavy wet diaper feels like at least 3 tablespoons or 45 ml of water on a dry diaper).	3 or more brown/green or yellow stools.
4 days old	At least 4 heavy wet diapers.	3 or more brown/green or yellow stools.
5–6 days old and older	At least 6 heavy wet diapers with pale yellow or clear urine.	3 or more large, soft, yellow, seedy stools (a large stool is the size of a quarter or larger). Baby should not be passing any meconium at this age.
6 weeks – 6 months	At least 6 heavy wet diapers. At all ages urine should be clear to pale yellow, with almost no odour.	3–4 per day or 1 very large soft, yellow, seedy stool/week. After 6 weeks some breastfed babies may have only 1 very large yellow stool every 1–7 days. This is normal as long as the stool has a consistency like toothpaste, or is seedy and watery, and the baby is healthy. It is also normal for some breastfed babies to have many stools each day.

Source: Adapted by Toronto Public Health from Wilson-Clay, 2008 and Best Start, 2009a.

4. Assess and teach the mother about adequate weight gain. Breastfed babies:

- May lose an average of 7% of their birth weight in the 3 days after birth.
- Should regain their birth weight by 10 days of age.
- Should show a pattern of weight gain by Day 5 onward.
- Should gain 20 – 35 g ($\frac{2}{3}$ – 1¼ oz) per day for the first 3 – 4 months of age.
- Tend to grow more quickly than non-breastfed babies in the first 6 months and grow more slowly in the second 6 months of life.

Source: Adapted from ILCA, 2010, *Dietitians of Canada, 2010, Dewey et al., 1992, and Powers, 2001 & 1999. See discussions regarding 'Weight Loss' and 'Infant Output' in General Principles.*

When the healthy term baby is effectively breastfeeding, the initial post-birth weight loss will stabilize quickly, and then reflect a steady weight gain.

The presence of any of the above weight loss indicators should be a sign that further assessment and support are needed to optimize breastfeeding.

Advise the mother that weight gain is only one of many indicators that will help her know how well her baby is breastfeeding. Her baby's behaviour will give her many signs that she can see every day (see notes in *General Principles*).

5. Assess and teach the mother about other signs of effective breastfeeding or breast milk transfer:

- Baby's mouth is moist and pink.
- Baby is alert and moves actively.
- Baby has a vigorous cry.
- Baby has good skin turgor.
- Baby's fontanels are flat and soft.
- Baby has no fever.
- Baby comes off the mother's breast looking relaxed and sleepy – the baby is satisfied.
- Mother's breasts feel softer and less full after breastfeeding.
- Mother's breasts experience the letdown or breast milk ejection reflex.
- Mother's nipple is elongated after breastfeeding but not pinched, blanched, or damaged.

Support the mother in understanding that the

volume of breast milk transferred is related to the infant's stomach size (*Protocol #1: The Initiation of Breastfeeding*).

6. Assess and teach the mother about the letdown or breast milk ejection reflex.

Signs of the Letdown or Breast Milk Ejection

Reflex

- Tingling sensation or feeling of tightening in the mother's breasts. This may be noticeable with only the first letdown, or they may feel nothing.
- Breast milk leaking or flowing when hearing the baby cry, or leaking from the opposite breast during breastfeeding.
- Filling of the ducts near the areola that can be felt with the fingers.
- Changes in the sucking pattern: sucking slows, pauses, and baby begins to swallow.
- Swallowing is heard.
- Uterine contractions or increased lochia, during or after breastfeeding, for the first few days.
- Mother may feel relaxed or drowsy.

Ideas to Help Initiate the Letdown or Breast Milk Ejection Reflex

When breastfeeding is initiated early, the baby's rooting, sucking and hand movements on the mother's breast are the natural stimuli for letdown.

- Breastfeed in a quiet, relaxed place.
- Mother feels relaxed, comfortable, and supported. Heat may be applied to her back or shoulders.
- Initiate breastfeeding before the baby is stressed and crying (early feeding cues).
- Clothe the baby only in a diaper to promote skin-to-skin contact.

Support the baby in a vertical chest-to-chest position to facilitate the baby's normal reflexes and self-attachment behaviours.

- Mother may massage her breasts. Mother may apply moist or dry heat to her breasts for a few minutes before or during massage until letdown occurs. Heat may be applied with a warm, wet towel or wet disposable diaper, a warm bath or shower, a bowl of warm water, a heating pad on low or a hot water bottle wrapped in a cloth.

- Hand express some breast milk (*Protocol #19: Expressing and Storing Breast Milk*).
- Mother may stimulate her nipples by gently rolling them between the thumb and index finger for several minutes, or until the letdown reflex occurs and breast milk leaks out. Express some breast milk (*Protocol #19: Expressing and Storing Breast Milk*).

General Principles

Letdown or the breast milk ejection reflex is essential to ensure that breast milk moves from the alveoli into the dilated ducts and is available to the baby (*How the Breast Works*). When breastfeeding is initiated early, the baby is calm and before the baby becomes overly hungry and begins crying, the baby's rooting and sucking are the natural stimuli for letdown (early feeding cues). Letdown or the breast milk ejection reflex is facilitated when the mother is relaxed and stress-free (*How the Breast Works*).

- Effective latching, positioning, and sucking are key for successful breastfeeding.
- A healthy full-term infant sucks, swallows, and breathes in a rhythmic and co-ordinated manner (Walker, 2011).
- The ratio of suck to swallow to breathe becomes 1:1:1 as the breastfeeding progresses, when letdown or breast milk ejection occurs and breast milk flows (Genna, 2008).
- The sucking rhythm corresponds inversely to the amount of breast milk available (Lauwers et al., 2011).

Infant weight loss and return to birth weight issues are complex. The traditional approach that weight loss must be prevented and controlled is founded on divergent understandings/misunderstandings that may lead to unnecessary supplementation and potentially put breastfeeding at risk (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).

A 2008 systematic review found insufficient evidence to determine the normal physiological weight loss for full-term breastfed infants in the first 2 weeks after birth. In fact, it advises against the use of a single absolute number for the maximum weight an infant can lose, as an absolute number does not take ranges or standard deviations from the mean into account. It also cautions that an absolute number may cause health care professionals to miss warning signs (Noel-Weiss et al., 2008).

A recent study further challenges the traditional determination of newborn birth weight and weight loss (Noel-Weiss et al., 2011). This observational study found that neonates appear to experience diuresis and correct their fluid status in the first 24 hours, and recommends that the initial infant weight be measured at 24 hours, instead of at birth, for a baseline when assessing weight change. The study found evidence that maternal IV fluids during parturition are related to neonatal output and newborn weight loss, but this is not something requiring intervention. They found that further weight loss after 72 hours is not likely connected to maternal fluids.

Although many practitioners may have been educated to consider 10% to be an acceptable initial post-birth weight loss, there has been a shift to consider a 7% loss to be the indicator for further and earlier assessment and support for breastfeeding. The Registered Nurses' Association of Ontario *RNAO Best Practice Guidelines* (RNAO, 2002), the International Lactation Consultant Association (ILCA) *Evidence-Based Guidelines for Breastfeeding Management during the First Fourteen Days* (ILCA, 1999), and the American Academy of Pediatrics (2005) indicate that families should seek help if weight loss is greater than 7% and/or continues after Day 3. This is consistent with the recommendations found in the Shrago (2006) and Livingstone (2001) studies.

There is a range of recommendations for what may be considered an acceptable time in which to recover birth weight. Whereas the RNAO recommends that birth weight should be achieved by 2–3 weeks, the 1999 ILCA guidelines advise that there should be a return to birth weight by 14 days. Recently, ILCA has further revised the above recommendations, such that the baby should lose less than 7% by Day 3, be gaining 20–35 gm ($\frac{2}{3}$ – 1 oz) a day by Day 5, and regain birth weight by 10 days (ILCA, 2010). This reflects the understanding that when the healthy term baby is effectively breastfeeding, the initial post-birth weight loss will stabilize quickly, and thereafter reflect a steady weight gain. It is also important to regard the presence of these weight loss indicators as a need for further support to optimize breastfeeding (Macdonald et al., 2003).

Weight gain beyond the first 2 weeks – World Health Organization (WHO) Child Growth Standard Charts (2006)

- Dietitians of Canada, Canadian Paediatric Society,

the College of Family Physicians of Canada, and Community Health Nurses of Canada recommend the adoption of the *Child Growth Standards* WHO growth charts in Canada, replacing previous recommendations to use the growth charts from the American Centers for Disease Control and Prevention (CDC).

- The 2006 WHO Child Growth Standards for birth to 5 years are recommended because they are based on children raised according to current Canadian and international health and nutrition recommendations. Breastfed infants were used as the normative model for growth and development. These charts illustrate the way all healthy children should grow and are considered to be the “gold standard” for assessing the growth of young children. Breastfed infants tend to grow more quickly than non-breastfed infants in the first 6 months and more slowly in the second 6 months of life. Since the WHO Child Growth Standards charts have been constructed based on the growth of infants who have been primarily breastfed, breastfed infants will no longer appear to be growing too rapidly during the first 6 months, nor will they appear to be failing to grow sufficiently from 6 – 12 months, (Dietitians of Canada, 2010).
- Growth charts can be useful tools to understand how one baby’s growth compares to the growth of other babies of the same age, but they can also confuse parents. Growth charts plot a baby’s growth on a series of percentile lines. An average child will be at the 50th percentile for weight and length. A weight that falls at a higher percentile is not necessarily “good” and a weight that falls at a lower percentile is not necessarily “bad”. This is because by definition there will be healthy children at every percentile. The most important point to remember is that a baby’s growth chart should never be considered in isolation. One needs to look at how this one point, i.e., weight compares to the other on the chart, i.e., length. The baby’s growth pattern over days, weeks, and months is what provides an accurate picture of how breastfeeding is going, and if over time the baby’s percentile drops, this is a signal to take a closer look (Mohrbacher, 2010). (See Appendix D and E – WHO Child Growth Standards charts for girls and boys.)

Note regarding infant weight gain: The standard for weight gain for the healthy term infant used in

this protocol is adapted from information in the foundational DARLING study Dewey et al. (1992), as well as from Powers (2001 & 1999), as cited in many breastfeeding studies and texts.

Infant Output as an Indicator of Effective

Breastfeeding – An increased number of daily bowel movements during the first 5 days is associated with positive infant outcomes, including less initial weight loss, earlier regaining of birth weight and heavier weight by Day 14. In addition, earlier transition to yellow, seedy stools (normal human breast milk stools) is also associated with the same positive infant outcomes (Shrago et al. 2006). This is reflected in an expectation that there will be more stools earlier, 3 or more, and up to 6 stools by Day 3. As above, if there are fewer stools or they do not change to soft yellow, seedy stools in the first week, this indicates a need for further early support to optimize breastfeeding.

The frequency and colour of urinary output also plays a role in assessing the effectiveness of breastfeeding as well as infant hydration status. The output chart indicates that the breastfed baby is getting enough breast milk if he produces at least 1 heavy wet diaper on Day 1, increasing by a diaper per day until Day 6, when there should be at least 6 heavy wet diapers with pale yellow or clear urine. A heavy wet diaper feels like at least 2 tablespoons or 30 ml of water poured on a dry diaper (Wilson-Clay, 2008). Urine becomes progressively darker in colour as a baby becomes dehydrated. In addition, the presence of urate or uric acid crystals in the diaper is a signal for further assessment. Uric acid crystals appear as pink, orange or brick-red dust staining the diaper, and may be mistaken for pseudo menses. This may be within normal expectations or it may reflect concentrated urine. Within the first 1–3 days, the presence of crystals is generally not significant (Lauwers, 2011), due to the high load of urate excreted by neonates. However, Passmore suggested that the large load excreted is facilitated by the concentration of urine (Passmore et al., 1974). High basal excretion of uric acid may increase risk of nephropathy (Stapleton, 1983). Further assessment and support are indicated to optimize breastfeeding and breast milk intake.

The Suck Cycle:

- With a wide-open mouth and tongue down, the infant takes the elastic tissue of the nipple, the areola and the surrounding breast tissue deep into

its mouth, taking in more of the lower areola. This forms a “teat” that fills the infant’s mouth.

- The pharynx is open for respiration.
- The infant’s lips are flanged out and together with the cheeks form a seal.
- The tip of the infant’s tongue stays over the gum behind the lower lip. The rest of the anterior tongue cups the areola of the mother’s breast.
- The jaw initially stabilizes the tongue in an upward position.
- As the jaw drops, the mid to posterior portion of the tongue is lowered.
- Decreasing negative pressure (increase in vacuum) is applied to the nipple and soft palate without an accentuated peristaltic motion (Geddes et al., 2008).
- The nipple elongates and is drawn back towards the junction of the infant’s hard and soft palate.
- The vacuum draws a bolus of breast milk to fill the oral space between the nipple and soft palate.
- The tongue then rises towards the palate, the vacuum decreases as negative pressure increases and a bolus of breast milk is moved into the pharynx, stimulating the swallow reflex. There may be a pause in sucks and breaths as the infant

swallows the breast milk.

- The infant lowers its jaw and a new cycle begins of suck, pause, and swallow.
- When the flow of breast milk decreases there will be increased bursts of sucking. This may occur more frequently in the early days because the volume of colostrum is so small (Riordan et al., 2010; Woolridge, 1986).

Nutritive vs. Non-nutritive Sucking:

- Nutritive sucking promotes the transfer of breast milk.
- Non-nutritive sucking promotes little or no breast milk transfer but is significant as it:
 - Stimulates the nipple and areola, triggering the release of prolactin and oxytocin, initiating letdown and flow of breast milk.
 - Increases gastrointestinal peristalsis.
 - Increases the secretion of digestive fluids.
 - Decreases crying; increases calm and comfort for the infant (Riordan et al., 2010).

References

American Academy of Pediatrics [AAP]. (2005). Breastfeeding and the use of human milk. Policy statement, American Academy of Pediatrics Electronic copy retrieved (2006) from: <http://pediatrics.aappublications.org/content/115/2/496.full>.

Best Start. (2009a). *Breastfeeding: Guidelines for consultants*. Electronic copy retrieved (2011) from: <http://www.beststart.org/resources/breastfeeding/pdf/breastfedskref09.pdf>.

Best Start. (2009b). *Breastfeeding your baby, guidelines for new mothers*. Electronic copy retrieved (2011) from: <http://www.beststart.org/resources/breastfeeding/pdf/magneng.pdf>.

Breastfeeding Committee for Canada [BCC]. (2011). *BFI integrated 10 steps practice outcome indicators for hospitals and community health services, Appendix 8.2*. Electronic copy retrieved (2011) from: http://breastfeedingcanada.ca/documents/BCC_BFI_20110704_Final_BCC_BFI_Integrated_Indicators_English.pdf.

Dewey, K.G., Heinig, M.J., Nommesen, L.A., Peerson, J.M., Lonnerdal, B. (1992). Growth of breast-fed and formula-fed infants from 0 to 18 months: The DARLING Study. *Pediatrics*, 89(6), 1035–1041.

Dietitians of Canada (2010). *A health professional’s guide for using the new growth charts*. Electronic copy retrieved (2011) from: http://www.dietitians.ca/Downloadable-Content/Public/DC_HealthProGrowthGuideE.aspx.

Geddes, D.T., Langton, D.B., Gollow, I., Jacobs, L.A., Hartmann, P.E. (2008). Frenulotomy for breastfeeding infants with ankyloglossia: Effect on milk removal and sucking mechanism as imaged by ultrasound. *Pediatrics*, 122, e188–194.

Genna, C. W. Watson (2008). *Supporting sucking skills in breastfeeding infants*. Sudbury (MA): Jones & Bartlett.

International Lactation Consultant Association [ILCA]. (2010). *Clinical guidelines for the establishment of exclusive breastfeeding 2005, updated 2010*.

- Lauwers, J., Swisher, A. (2011). *Counseling the nursing mother: A lactation consultant's guide*. (5th ed.) Sudbury (MA): Jones & Bartlett Publishers.
- Livingstone, V.E., Willis, C.E., Abdel-Wareth, L.O., Thiessen, P., Lockitch, G. (2001). Neonatal hypermatremic dehydration associated with breastfeeding malnutrition: A retrospective survey. *Canadian Medical Association Journal*, 2000;162(5), 647–652.
- Macdonald, P.D., Ross, S.R.M., Grant, L., Young, D. (2003). Neonatal weight loss in breast and formula fed infants. *Archives of Disease in Childhood: Fetal and Neonatal Edition*, 88(6), F472–476.
- Mohrbacher, N. (2010). *Breastfeeding answers made simple*. Amarillo (TX): Hale Publishing.
- Noel-Weiss, J., Woodend, A.K., Peterson, W.E., Gibb, W., Groll, D.L. (2011). An observational study of associations among maternal fluids during parturition, neonatal output and breastfed newborn weight loss. *International Breastfeeding Journal*, 6(9), Provisional pdf. Electronic copy retrieved (2011) from: <http://www.internationalbreastfeedingjournal.com/content/pdf/1746-4358-6-9pds>.
- Noel-Weiss, J., Courant, G., Woodend, A.K. (2008). Physiological weight loss in the breastfed neonate: A systematic review. *Open Medicine*, 2(4), 11–22. <http://www.openmedicine.ca/article/view/183/204>.
- Passmore, R., Nicol, B.M., Narayana Rao, M., Beaten, G.H., Demayer, E.M. (1974). *Handbook on Human Nutritional Requirements*, World Health Organization [WHO]. Monograph Series. No. 61.
- Powers, N.G. (2001). How to assess slow growth in the breastfed infant. *Pediatric Clinics of North America*, 48(2), 345–363.
- Powers, N.G. (1999). Slow weight gain and low milk supply in the breastfeeding dyad. *Clinics in Perinatology*, 26(2), 399–430.
- Registered Nurses Association of Ontario [RNAO]. (2002). *Breastfeeding: Fundamental concepts, a self-learning package*. Registered Nurses Association of Ontario. Electronic copy retrieved (2011) from: <http://rnao.ca/bpg/courses/breastfeeding-e-learning>.
- Registered Nurses Association of Ontario [RNAO]. (2002). *Breastfeeding best practice guidelines for nurses*. Registered Nurses Association of Ontario. Electronic copy retrieved (2011) from: http://rnao.ca/sites/rnao-ca/files/Breastfeeding_Best_Practice_Guidelines_for_Nurses.pdf.
- Riordan, J., Waumbach, K. (2010). *Breastfeeding and human lactation*. (4th ed.) Sudbury (MA): Jones & Bartlett, 98–111.
- Shrago, L.C., Reifsnider, E., Insel, K. (2006). The neonatal bowel output study: Indicators of adequate breast milk intake in neonates. *Pediatric Nursing*, 32(3), 195–201.
- Smillie, C. (2005). *Baby-led latching: A neurobehavioral model*. 15th Annual National Breastfeeding Seminar, Normalizing Breastfeeding: The 21st Century Challenge. Toronto, ON, 114–127.
- Stapleton, F.B. (1983). Renal uric acid clearance in human neonates. *Journal of Pediatrics*, 103(2), 290–4.
- Toronto Public Health [TPH]. (Updated 2011). *Breastfeeding after the first six months*, Pamphlet
- Toronto Public Health [TPH]. (2007). *Standards for infant assessment*. Toronto, ON: Author.
- Walker, M. (2011). *Breastfeeding management for the clinician, using the evidence*. (2nd ed.) Sudbury (MA): Jones & Bartlett.
- Wilson-Clay, B., Hoover, K. (2008). *The breastfeeding atlas*. (4th ed.) Manchaca (TX): BWC/KH Joint Venture, p. 25–28.
- Woolridge M. (1986). The anatomy of infant feeding. *Midwifery*, 1986 2(4). 164-171.
- World Health Organization [WHO] (2006), WHO Child Growth Standards
http://www.who.int/nutrition/media_page/en/
http://www.who.int/nutrition/media_page/backgrounders_1_en.pdf
http://www.who.int/nutrition/media_page/backgrounders_2_en.pdf