

BREASTFEEDING PROTOCOL: Signs of Effective Breastfeeding



**BABY-FRIENDLY
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The Breastfeeding Protocols are based on the City of Toronto’s Breastfeeding Protocols for Health Care Providers (2013) and are co-owned by the City of Toronto, Toronto Public Health Division (TPH) and the Toronto East Health Network, Baby-Friendly Initiative (BFI) Strategy for Ontario. Revised Protocols are being released as they are completed, and they are available available at <https://breastfeedingresourcesontario.ca/resource/breastfeeding-protocols-health-care-providers>. All revised Protocols, as well as the complete set of 2013 Protocols, are available at www.toronto.ca/wp-content/uploads/2017/11/9102-tph-breastfeeding-protocols-1-to-21-complete-manual-2013.pdf. For more details on the revision process and terminology, please see the *Introduction to Breastfeeding Protocols for Health Care Providers*.

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Process

The process of revising and updating the Protocol followed a clear methodology based on Evidence-Informed Decision Making in Public Health www.nccmt.ca, developed by the National Collaborating Centre for Methods and Tools (NCCMT) and is described in the full Introduction, linked above. Every effort has been made to ensure the highest level of evidence is reflected.

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Use of this Protocol

The BFI Strategy for Ontario and TPH encourage individuals and organizations to use this Protocol to support evidence-informed clinical practice. This Protocol may be copied or printed for the purpose of educating health care practitioners, provided the authors are acknowledged and content is not altered, nor used or reproduced for commercial gains.

Disclaimer

Every breastfeeding dyad and their circumstances must be assessed on an individual basis. In doing so, health care providers use their own professional judgement along with the evidence in assessing the care and support that the family needs. At times, consultation with another breastfeeding expert or advice from a medical practitioner, (physician, midwife, or nurse-practitioner), will be required.

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Key Messages

1. Infants with an effective suck and swallow will:
 - a) Elicit a mother's breast milk ejection reflex.
 - b) Have adequate breast milk transfer.
 - c) Help stimulate and/or maintain adequate breast milk production.
2. Adequate infant hydration and output are indicators of effective breastfeeding.
3. With effective breastfeeding, a healthy term infant's initial weight loss will stabilize within 3-4 days and then be followed by a steady weight gain.
4. The World Health Organization (WHO) Growth Charts for Canada are an accurate, reliable tool to assess infant growth.

Breastfeeding Reminders

- Early and often.
- Effective (optimal latch).
- Exclusive (no supplements).

With permission from: *Physician's Toolkit Breastfeeding Quick Reference Guide*, Baby-Friendly Council of Newfoundland and Labrador.

A breastfeeding assessment of the newborn includes assessing the infant's ability to latch and coordinate sucking, swallowing, and breathing. Monitoring infant output, behaviour and weight must be conducted regularly as the newborn develops. This assessment will indicate if breast milk transfer is adequate and if developmental milestones are achieved. Early assessment and reassessment of infant feeding, growth and development are essential and provide the opportunity to discuss any breastfeeding concerns and determine appropriate interventions, as needed (RNAO, Breastfeeding Best Practice Guideline, 2018).

Prior to discharging any newborn, it is important to ensure that infant follow-up has been planned with a health care provider within a few days of discharge (The College of Family Physicians of Canada, 2017). As length of stay for mothers and infants varies, the Standards of Postnatal Care for Mothers and Newborns in Ontario recommends a complete newborn exam by a physician or midwife within 24-72 hours after discharge. They also advise that breastfeeding support be provided throughout the first week postpartum to facilitate exclusive breastfeeding (Provincial Council for Maternal and Child Health, 2018).

Skilled support from a combination of professional and trained peers or lay people helps breastfeeding mothers and infants as they transition between hospital and community services (Provincial Council for Maternal and Child Health, 2018).

Ongoing, regular monitoring of infant growth should occur at all well-baby visits with suggested intervals of the following: within initial weeks of birth and at one, two, four, six, nine, 12, 18 and 24 months (Dietitians of Canada, 2014; Lemyre, Jeffries, O'Flaherty, & Canadian Paediatric Society, 2018). More frequent monitoring may be necessary in some situations.

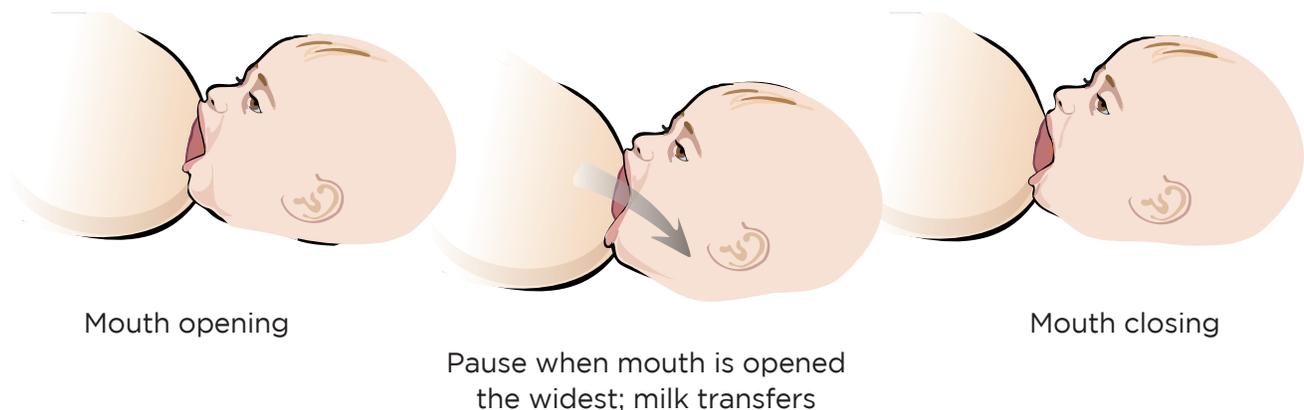
1. Effective suck and swallow

Encourage mothers to:

- Initiate uninterrupted skin-to-skin contact immediately after birth and begin breastfeeding in response to infant feeding cues. See *Initiation of Breastfeeding Protocol*.
- Listen and watch for swallowing, especially after breast milk volume increases (Riordan, 2016).

Understand that:

- An infant's rooting, suckling, and hand movements on the mother's breast stimulates the release of oxytocin, initiating letdown, and the flow of milk (Riordan, 2016).
- Effective sucking and swallowing occur in a coordinated manner, with bursts of sucking alternating with pauses.
- Two types of sucking patterns may be observed in a breastfed infant, non-nutritive and nutritive sucking (Sakalidis et al., 2016).
- **Non-nutritive sucking** is observed as a faster sucking rate that occurs when breast milk flow is slow or absent, often occurring at the beginning or the end of a breastfeed. These shallow and quick sucks help to stimulate a letdown (Sakalidis et al., 2016).
- Non-nutritive sucking promotes little or no breast milk transfer but is significant as it:
 - Stimulates the nipple and areola.
 - Triggers the release of oxytocin, initiating letdown and flow of breast milk.
 - Triggers the release of prolactin, important to milk production.
 - Increases gastrointestinal peristalsis in the infant.
 - Increases the secretion of digestive fluids in the infant.
 - Decreases crying; increases calm and comfort for the infant (Riordan, 2016).
- **Nutritive sucking** occurs during rapid milk flow, often with a letdown and promotes the transfer of milk. Nutritive sucking bursts tend to be longer and occur often at the beginning and middle of a breastfeed (Sakalidis et al., 2016).
- The infant's sucking rate slows to accommodate swallowing (Watson Genna, 2017).
- During nutritive sucking, there is a wider jaw opening and slight pause as milk transfers into the infant's mouth (open-pause-close). See illustration below.



a) Signs of letdown or breast milk ejection reflex

In response to infant sucking, oxytocin is released from the posterior pituitary gland causing the milk ejection reflex (MER) or letdown. After lactation becomes established there may be multiple letdowns during a feed (Riordan, 2016).

When letdown occurs:

- Infant's nutritive sucking pattern will change, sucking frequency will slow down, swallowing will be observed and heard, and the rate of swallowing will increase.
- Mothers may experience a tingling sensation or a feeling of breast tightening. This may be noticeable with only the first letdown and in varying degrees of intensity. Other mothers may feel nothing. All these experiences are normal.
- Mothers may experience a feeling of being relaxed or drowsy as a result of oxytocin release (Mohrbacher, 2010; Riordan, 2016).

In relation to letdown, mothers may or may not experience:

- Breast milk leaking or flowing when hearing their infant cry (Mohrbacher, 2010).
- Breast milk leaking from the opposite breast during a breastfeed (Mohrbacher, 2010).
- Uterine contractions or increased lochia during or immediately after breastfeeding. This is more common the first days postpartum and is due to the release of oxytocin (Lawrence, 2016; Mohrbacher, 2010; Riordan, 2016).

Helping to initiate the letdown or breast milk ejection reflex

The infant's rooting, sucking, and hand movements on the breast are natural stimuli for letdown (Riordan, 2016). If help to initiate the letdown is needed, encourage the mother to try some or all of the following:

- Choose a relaxed and comfortable position, where arms and back are well supported. See *Positioning and Latching Protocol*.
- Initiate breastfeeding before the infant is stressed and crying. See *Initiation of Breastfeeding Protocol*.
- Massage breasts before feeding.
- Hand express some breast milk to get the breast milk flowing. See *Expressing, Collecting, and Storing of Human Milk Protocol*.
- Stimulate nipples by gently rolling them between the thumb and index finger until the letdown reflex occurs and breast milk is observed.
- Practice safe skin-to-skin contact (BCC, 2017) to encourage infant's natural reflexes and tendency to breastfeed (Walker, 2017).

Infant suck cycle

Healthy full-term infants will suck, swallow, and breathe in a rhythmic and co-ordinated manner. Coordination of the suck-swallow-breathe cycle is a reflex that is critical to the infant's ability to breastfeed efficiently and effectively (Sakalidis et al., 2016; Walker, 2017).

The following are normal and more technical aspects of the suck cycle:

- Infant sucking requires a complex interaction and coordination of the jaw, hyoid bone, palate, pharynx, and tongue to coordinate milk removal during breastfeeding (Sakalidis et al., 2016).
- With a wide-open mouth and tongue down, the infant takes the nipple, the areola, and the surrounding breast tissue deep into its mouth (Riordan, 2016).
- The infant's tongue, lips, and cheeks assist to form a seal on the breast (Riordan, 2016).
- The function of the tongue is important. The tongue must remove milk from the breast and safely transfer the milk bolus to the pharynx for swallowing (Sakalidis et al., 2016).

Mechanism of milk removal:

Two ideas exist describing the sucking mechanism and tongue movement of infants during milk removal:

- The stripping action of the tongue, which supports compression of the breast (positive pressure) as the principle force of milk removal (Sakalidis et al., 2016).
- The intra-oral vacuum theory suggests that sucking creates a vacuum (negative pressure) which is the primary mechanism of milk removal (Sakalidis et al., 2016).
- Emerging research suggests that vacuum in combination with positive pressure during milk ejection is the predominant factor involved in milk removal (Sakalidis, 2016).
- It is thought that the alternation of vacuum and compression occur in breastfeeding.
- Milk flow stops as compression of the nipple is applied. Milk flow begins as compression is released during which time a stronger vacuum is generated by the infant's sucking and tongue movement (Sakalidis, 2016).
- Vacuum is thought to be necessary to create the seal on the breast. (Sakalidis et al, 2013).
- Vacuum is generated as the tongue and jaw move down, which allows milk flow from the nipple. When the posterior part of the tongue drops to its lowermost position, peak vacuum occurs and milk flows into the infant's mouth (Walker, 2017).
- Once a bolus of milk is in the infant's mouth, the tongue rises towards the palate (compression). Oral vacuum decreases and milk flow stops. A bolus of milk is moved into the pharynx stimulating the infant's swallow reflex. This cycle then repeats itself (Sakalidis et al., 2016; Walker, 2017).



Suck-Swallow-Breathe coordination:

- It is important to monitor suck-swallow-breathe coordination of an infant during a feeding. Patterns during breastfeeding are likely to be influenced by changes in milk flow, infant fatigue, and infant feeling full (Sakalidis et al., 2013).
- The suck to swallow to breathe ratio of 1:1:1 or 1:1:2 is not well supported by research as this concept seems to have originated from bottle-feeding studies (Sakalidis et al., 2016).
- Emerging research supports the notion that the suck-swallow-breathe ratio is highly variable during breastfeeding, indicating an infant can rapidly adapt to changing breast milk flow rates during a letdown (Sakalidis et al., 2016).
- The sucking rhythm corresponds to the amount of breast milk available and patterns change as the infant grows (Riordan, 2016).

b) Breast milk transfer

Assessment and observation

- Mother and infant achieve and maintain an effective latch and a comfortable position. See *Positioning and Latching Protocol*.
- Mother feels their breast being gently pulled or tugged with no pain. Some mothers may experience mild discomfort with latching in the first days or during the early seconds of each feed. This pain usually disappears. If pain persists, mothers would benefit from having the latch assessed by a knowledgeable breastfeeding professional or peer supporter.
- Infant is comfortable and does not appear distressed during the feeding. The latch remains comfortable for the mother as the baby suckles.
- Infant sucks, swallows, and breathes in a controlled rhythmic and co-ordinated pattern (Riordan, 2016).
- Swallowing sounds may be heard (e.g., quietly exhaled, audible “kah” sounds, with no clicking or smacking sounds (Mohrbacher, 2010).
- With small breast milk volume, such as with colostrum, swallowing may not be heard and may only be visualized or palpable on the infant’s throat (Walker, 2014).
- Infant respiration during sucking pauses is usually quiet, unlaboured, and perhaps slightly more rapid than the rate of breathing during the sucking bursts (Watson Genna, 2017).
- Infant takes feeding pauses, fewer at the beginning and more as the feed progresses.
- Mother’s breasts may feel full and firm before a feeding and soften and feel less full after the feeding. This may be more noticeable in the first 6-8 weeks.
- Infant comes off the mother’s breast looking relaxed and sleepy; the infant is usually content.
- Mother’s nipple may become elongated after breastfeeding but not pinched, blanched, or damaged (ILCA, 2014).



Observe breast milk transfer in the following videos from BreastFeeding Inc.:

- Really Good Drinking
- Good Drinking

<https://ibconline.ca/breastfeeding-videos-english/>

c) Strategies to improve breast milk transfer and breast milk production

Encourage mother to:

- Respond to early feeding cues.
- Breastfeed as often as the infant is showing feeding cues, and at least 8 times in 24 hours. See *Initiation of Breastfeeding Protocol*.
- Not wait until breasts are feeling hard, engorged, or overfull.
- Ensure that the infant is positioned well and latched effectively. See *Positioning and Latching Protocol*.

Ensure that the mother knows how to:

- Hand express and provide the infant with expressed breast milk. See *Expressing, Collecting, and Storing of Human Milk Protocol*.
- Use breast compression and switch nursing if necessary, as described below.



Breast compressions:

Breast compressions during a feeding, may increase milk transfer and encourage the infant to suck more effectively.

Use breast compressions when:

- An infant is not effectively sucking and swallowing.
- The mother's breasts are not softening during feeding time.
- The infant needs more milk.

To do breast compression, encourage the mother to:

- Hold the breast with her fingers on one side, thumb on the other, away from the areola. See illustration below.
- Compress (firm but gentle squeeze) the breast when the infant's sucking slows down.
- Hold the compression but do not press so hard that it hurts the breast.
- Release the compression when the infant pauses or stops sucking. Most infants will stop sucking completely when the compression is released and will resume sucking again shortly thereafter. If the infant does not resume effective sucking, compress a different area of the breast (Mohrbacher, 2010).
- Continue with breast compressions until the infant is no longer sucking effectively.
- Offer the other breast using breast compressions as needed.

Observe breast compression in the following video and information link:

- Breast compression <https://ibconline.ca/breastfeeding-videos-english/>
- 2-Day Old/Compressions <https://ibconline.ca/breastfeeding-videos-english/>



Switch nursing:

Switch nursing involves moving the infant frequently from breast to breast to facilitate more active swallowing and to promote multiple letdowns during the feeding. This may be especially helpful in the early days or weeks (Riordan, 2016).

Use switch nursing when an infant:

- Is routinely sleepy and at risk of gaining weight slowly (Riordan, 2016).
- Spends a large part of a breastfeed in a non-nutritive sucking pattern and is gaining weight slowly (Riordan, 2016).

During a feeding the mother is encouraged to observe for a change from nutritive to non-nutritive sucking. At that point, the mother may try breast compressions and/or switch to the other breast to increase milk transfer and, if needed, encourage more effective sucking. Switching breasts can be done several times during the same feeding and is usually called switch nursing.

Switch nursing, combined with breast compressions, may help to maximize milk transfer (Riordan, 2016). Although there is no research on this technique, it is widely recommended by health care providers who provide breastfeeding support.

Waking techniques such as burping and upright positioning can also encourage an infant to feed longer.

2. Adequate infant hydration and output

Assessment and observation

Signs of infant hydration include:

- Infant's mouth is moist and pink.
- Infant is often alert and moves actively before a feeding.
- Infant has normal skin turgor.
- Infant's fontanelles are flat and soft.
- If crying, the infant's cry is vigorous.
- Infant has adequate output for age and appropriate weight gain. See more about weight in *Section #3* and a stand-alone reference in *Appendix #1*.



To monitor adequate output, teach parents to:

- Track the number of wet diapers and bowel movements in a 24 hour period.
- Assess if a diaper is wet:
 - Feel for wetness in a cloth diaper.
 - Feel or see expansion in a disposable diaper. You may demonstrate what a wet diaper will feel like by pouring 45 ml (3 tablespoons) of water onto a diaper liner.
 - Optionally, place a tissue in the diaper, as tissue wetness is easy to determine.
- Assess urine concentration:
 - In the early days, urine can be concentrated, noticeably yellow, and sometimes has an odour.
 - The presence of uric acid crystals, or pink/red stains in the diaper, may be insignificant during the first week of life. If noted, assessment of adequate hydration is important (Riordan, 2016).
 - As breast milk volume increases, an infant's urine will become pale or clear and odourless. The volume of urine increases, and wet diapers are noticeably heavier.

- Evaluate normal bowel movements (ILCA, 2014; Wilson-Clay, et al. 2017):
 - First few stools are black, tar-like meconium.
 - Stools lighten in colour to greenish brown within the first few days.
 - Have three or more stools a day by day three.
 - Transition to loose yellow stools that may or may not be seedy by day five.

It has been identified that (ILCA, 2014; Wilson-Clay, et al., 2017):

- Early transition to yellow stool is associated with less infant weight loss and earlier weight gain.
- Delayed transition to light-coloured stools or lack of infant stooling may be a sign of ineffective milk intake.

Health care providers can refer families to this useful resource below from Best Start:

SIGNS THAT FEEDING IS GOING WELL

Your Baby's Age	1 WEEK							2 WEEKS	3 WEEKS
	1 DAY	2 DAYS	3 DAYS	4 DAYS	5 DAYS	6 DAYS	7 DAYS		
How Often Should You Breastfeed? Per day, on average over 24 hours	 At least 8 feeds per day. Your baby is sucking strongly, slowly, steadily and swallowing often.								
Your Baby's Tummy Size	 Size of a cherry		 Size of a walnut		 Size of an apricot		 Size of an egg		
Wet Diapers: How Many, How Wet Per day, on average over 24 hours	 At least 1 WET	 At least 2 WET	 At least 3 WET	 At least 4 WET	 At least 6 HEAVY WET WITH PALE YELLOW OR CLEAR URINE				
Soiled Diapers: Number and Colour of Stools Per day, on average over 24 hours	 At least 1 to 2 BLACK OR DARK GREEN		 At least 3 BROWN, GREEN, OR YELLOW			 At least 3 large, soft and seedy YELLOW			
Your Baby's Weight	Most babies lose a bit of weight in the first 3 days after birth.				From day 4 onward, most babies gain weight regularly.				
Other Signs	Your baby should have a strong cry, move actively and wake easily. Your breasts feel softer and less full after breastfeeding.								

Breast milk is all the food a baby needs for the first six months.
 You can get advice, help and support from:

- Your health care provider.
- Telehealth Ontario's specialized breastfeeding services support line at 1-866-797-0000 or TTY at 1-866-797-0007.
- Bilingual Online Ontario Breastfeeding Services directory at www.ontariobreastfeeds.ca.

2018

Available in 20 languages from Best Start by Health Nexus.

3. Infant weight

- Weight gain is another variable that indicates how well an infant is growing and breastfeeding. Each infant follows a unique weight gain pattern.
- With effective breastfeeding, a healthy term infant's initial weight loss will stabilize within 3-4 days and then be followed by a steady weight gain.
- There are many factors that can affect the amount of weight that a newborn loses after birth. Research suggests the following variables may be associated with infant weight loss (DiTomasso et al., 2017):
 - Intravenous fluids given during labour.
 - Caesarean birth.
 - Jaundice.
 - Advanced maternal age.
 - Parental education.
 - True insufficient milk supply.
- A breastfeeding assessment of the mother-baby pair needs to be considered within their context, including observations of infant behaviour, output, and feeding behaviours. Weight measurement should be included in the infant assessment however, it may not be the only reason for clinical decisions (Noel-Weiss et al., 2011).
- Monitoring weight changes in the early weeks after birth is a vital part of a newborn assessment (DiTomasso et al., 2017).
- Exacerbated infant weight loss is strongly associated with decreased likelihood of exclusive breastfeeding for infants born both vaginally and by caesarean section. In this case extra breastfeeding support should be provided (Flaherman et al., 2017).



Assessment and observation

Breastfed infants:

- May have a mean (*average*) birth weight loss of 7-8% in the first few days after birth. (DiTomasso et al., 2017; Flaherman et al., 2017; Paul, et al., 2017; Thulier, 2017).
- Typically, infants reach their lowest weight (weight nadir) within 3-4 days of delivery (DiTomasso et al., 2017; Paul, et al., 2017; Thulier, 2016).
- Should be gaining weight daily by 4-6 days (ABM, 2014).
- Should regain their birth weight by 10-14 days (ABM, 2014) however, some may take up to 2-3 weeks to surpass their birth weight (Paul et al., 2016). An infant who is not back to birth weight by the first 10 days, but who has demonstrated a steady appropriate weight gain for several days, and has other signs of hydration, is likely fine. The infant needs continued close follow up (ABM, 2014).

- Infants born by caesarean birth tend to lose more weight on average (closer to 8%) and take longer to regain their birth weight (DiTomasso et al., 2017; Flaherman et al., 2017; Paul et al, 2017; Thulier, 2016).

When an infant has regained their birth weight, steady weight gain over time is a strong indicator of adequate infant intake and effective breastfeeding (Health Canada, 2015).

Note: Some infants take longer to regain their birth weight. Before deciding that exclusive breastfeeding is inadequate, the health care provider must consider other factors that may contribute to slow weight gain. These may include, but are not limited to the following:

- An infant's birth weight and growth trajectory.
- A mother's milk supply and milk transfer.
- Acute or chronic illness of the infant.
- Anatomical abnormalities (such as tongue tie, jaw asymmetry) of the infant.
- Maternal conditions such as retained placenta, previous breast or chest surgery and hormonal issues (such as thyroid conditions) (Dietitians of Canada, 2014).

See Appendix A: Average Weight Gain of a Breastfed Infant.

4. The WHO Child Growth Charts for Canada

The 2014 WHO Child Growth Charts for Canada are recommended for monitoring and assessment of growth of Canadian infants and children based on a review by Dietitians of Canada, Canadian Paediatric Society, Canadian Pediatric Endocrine Group, The College of Family Physicians of Canada, and Community Health Nurses of Canada.

The charts were constructed based on the growth of healthy breastfed infants, nurtured according to current Canadian and international nutrition and health recommendations. The research behind the charts clearly establishes the breastfed infant as the normative model for growth and development. Both breastfed and non-breastfed infants' growth patterns should be monitored using these growth tools (Dietitians of Canada, 2014).

Accurate, reliable measurements using quality equipment that is regularly calibrated are fundamental to growth monitoring and to making sound clinical judgements (Dietitians of Canada, 2014). Detailed information can be found at: www.dietitians.ca/growthcharts.

Infant growth monitoring helps the health care provider:

- Determine whether a child is growing adequately.
- Provide anticipatory guidance to parents and support positive habits to promote healthy growth and development.
- Identify potential problems early, allowing the provider and parents to work together to initiate action before the child's nutritional status or health is compromised (Dietitians of Canada, 2014).

Preterm growth charts:

The WHO growth charts lack data on preterm infants as they exclude infants born before 37 weeks gestation. Alternate growth charts are recommended for this population of infants, which may include the Fenton growth charts. According to the American Academy of Pediatrics' Nutrition Handbook (2014), these charts are commonly used for preterm infants and low birth weight infants in neonatal intensive care units and are currently being used in 38 countries.

More Information on Fenton growth charts is available at: www.ucalgary.ca/fenton/2013chart.

The growth of preterm infants once discharged from the neonatal intensive care unit and infants with special health care needs should be monitored using the WHO Child Growth Standards. When plotting measurements of premature infants use the corrected age at least until 24-36 months of age (Dietitians of Canada, 2014).

Appendices in this Protocol (see below)

- A) Average Weight Gain of a Breastfed Infant

Key Resources

Baby-Friendly Newfoundland & Labrador

- The Physician's Toolkit Breastfeeding Quick Reference Guide (2014)
- The Physician's Toolkit Breastfeeding Reference Manual (2014)
- Baby-Friendly videos and other resources.
www.babyfriendlynl.ca/breastfeeding-information/resources

Best Start by Health Nexus

Breastfeeding and infant feeding resources.

www.beststart.org

Breastfeeding Resources Ontario

Quality evidence-informed resources that support the Baby-Friendly Initiative (BFI) such as written resources, videos, and links in one centralized source.

www.breastfeedingresourcesontario.ca

Dietitians of Canada and WHO Growth Charts

A Health Professional's Guide for using the WHO Growth Charts for Canada, and useful tools to understand an infant/child's growth.

www.dietitians.ca/Downloads/Public/DC_HealthProGrowthGuideE.aspx and

www.dietitians.ca/growthcharts

Fenton Growth Charts

Growth charts for preterm infants.
www.ucalgary.ca/fenton/2013chart

International Breastfeeding Centre

Information, videos, and to ask a question.
www.ibconline.ca

International Lactation Consultant Association

Clinical guidelines for the establishment of exclusive breastfeeding.
www.feedthebabyllc.com/main/wp-content/uploads/2012/07/lactationClinicalGuidelinesREV2010-2.pdf

La Leche League Canada

Find breastfeeding information sheets and find a group.
www.lllc.ca

La Leche League International

Find breastfeeding information.
www.llli.org

Newborn Weight Tool

A tool for health care providers to plot an infant's weight percentile in the first few days following birth.
www.newbornweight.org

Public Health Agency of Canada

Family-Centred Maternity and Newborn Care: National Guidelines.
www.canada.ca/en/public-health/services/publications/healthy-living/maternity-newborn-care-guidelines-chapter-6.html

Rebecca Glover Breastfeeding Education Materials

Follow Me Mum: The Key to Successful Breastfeeding and other resources.
www.rebeccaglover.com.au

Registered Nurses Association of Ontario

- Best Practice Guideline: Breastfeeding – Promoting and Supporting the Initiation, Exclusivity, and Continuation of Breastfeeding in Newborns, Infants and Young Children (2018)
- Mother/Infant Self-Reflection Guide for Nurses and Clinical Case Studies.
www.rnao.ca

The Academy of Breastfeeding Medicine

Breastfeeding Protocols.
www.bfmed.org/

Toronto Public Health

[Breastfeeding Protocols for Health Care Providers](#)

References

- Academy of Breastfeeding Medicine (ABM). (2014). ABM clinical protocol #2: Guideline for hospital discharge of the breastfeeding term newborn and mother: "The going home protocol". *Breastfeeding Medicine*, 9(1), 3-9.
- Baby-Friendly Newfoundland & Labrador. (2014). *Physician toolkit: Breastfeeding reference manual*. Retrieved from <https://babyfriendlynl.ca/support/physicians/>
- Best Start Resource Centre. (2017). Breastfeeding: *Guidelines for consultants-desk reference*. Retrieved from <https://resources.beststart.org/product/b03e-breastfeeding-guidelines>
- Breastfeeding Committee for Canada. [BCC]. (2017). *The BFI 10 Steps and WHO Code Outcome Indicators for Hospitals and Community Health Services*. Retrieved from www.breastfeedingcanada.ca
- College of Family Physicians of Canada. (2017). *Priority Topics and Key Features for the Assessment of Competence in Intrapartum and Perinatal Care*. Retrieved from www.cfpc.ca/uploadedFiles/Education/MNC-booklet-Phases-Dimensions-Final.pdf
- Dietitians of Canada. (2014). *A health professionals guide for new growth charts*. Retrieved from www.dietitians.ca/Downloads/Public/DC_HealthProGrowthGuideE.aspx
- DiTomasso, D., & Paiva, A. (2017). Neonatal weight matters: An examination of weight changes in full-term breastfeeding newborns during the first 2 weeks of life. *Journal of Human Lactation*, 1-7.
- Flaherman, V., Schaefer, E., Kuzniewicz, M., Sherian, L., Walsh, E., & Paul, I. (2017). Newborn weight loss during birth hospitalization and breastfeeding outcomes through age 1 month. *Journal of Human Lactation*, 33(1), 225-230.
- Health Canada. (2015). Nutrition for healthy term infants: Recommendations from birth to six months. Retrieved from www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/infant-feeding/nutrition-healthy-term-infants-recommendations-birth-six-months.html
- International Lactation Consultant Association [ILCA]. (2014). *Clinical guidelines for the establishment of exclusive breastfeeding*. (3rd ed.).
- Lawrence, R., & Lawrence, M. (2016). *Breastfeeding: a guide for the medical profession*. (8th ed.). (MO): Mosby.
- Lemyre, B., Jefferies, A., O'Flaherty, P., & Canadian Paediatric Society. (2018). Facilitating discharge from hospital of the healthy term infant. *Paediatrics & Child Health*, 23(8), 515-522.
- Mohrbacher, N. (2010). *Breastfeeding answers made simple a guide for helping mothers*. Amarillo (TX): Hale Publishing.
- Noel-Weiss, J., Woodend, A., Peterson, W., Gibb, W., & Groll, D. (2011). An observational study of associations among maternal fluids during parturition, neonatal output, and breastfed newborn weight loss. *International Breastfeeding Journal*, 6(9).
- Ontario Society of Nutrition Professionals in Public Health. (2014). Pediatric nutrition guidelines (birth to six years) for health professionals. Retrieved from www.odph.ca/upload/membership/document/pediatric-nutrition-guidelines-for-health-professionals-2014_1.pdf.

Paul, I., Shaefer, E., Miller, J., Kuzniewicz, M., Li, S., Walsh, E., & Flaherman, V. (2017). Weight change nomograms for the first month after birth. *Pediatrics*, 138(6).

Provincial Council for Maternal and Child Health. (2018). *Standards of Postnatal Care for Mothers and Newborns in Ontario: Birth to one-week postnatal period*. Retrieved from www.pcmch.on.ca/wp-content/uploads/2018/05/Standards-of-Postnatal-Care-for-Mothers-and-Newborns-in-Ontario-Final-Report-Part-I-2018May16.pdf

Registered Nurses' Association of Ontario [RNAO]. (2018). *Breastfeeding-Promoting and Supporting the Initiation, Exclusivity, and Continuation of Breastfeeding in Newborns, Infants and Young Children*. Retrieved from rnao.ca/bpg/guidelines/breastfeeding-promoting-and-supporting-initiation-exclusivity-and-continuation-breast

Riordan, J., & Waumbach, K. (2016). *Breastfeeding and human lactation*. (5th ed.). Sudbury (MA): Jones & Bartlett.

Sakalidis, V., Kent, J., Garbin, C., Hepworth, A., Hartmann, P., & Geddes, D. (2013). Longitudinal changes in suck-swallow-breathe, oxygen saturation, and heart rate patterns in term breastfeeding infants. *Journal of Human Lactation*, 29(2), 236-245.

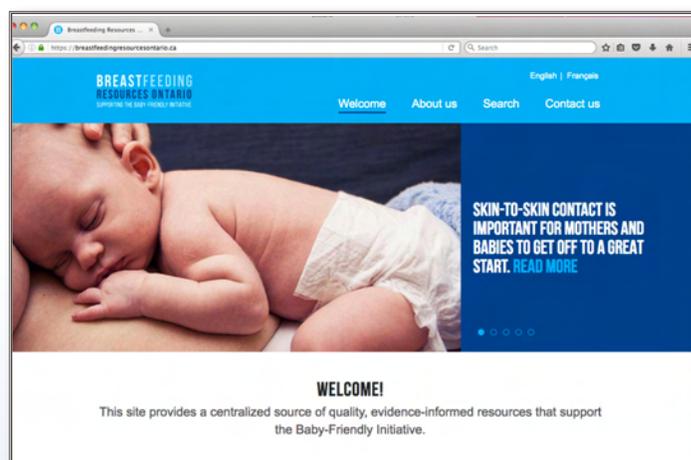
Sakalidis, V., & Geddes, D. (2016). Suck-swallow-breathe dynamics in breastfed infants. *Journal of Human Lactation*. 32(2), 201-211.

Thulier, D. (2017). Challenging expected patterns of weight loss in full-term breastfeeding neonates by caesarean. *Journal of Obstetrical, Gynecological and Neonatal Nursing*, 46(1), 18-28

Walker, M. (2017). *Breastfeeding management for the clinician: Using the evidence* (4th ed.). Sudbury (MA): Jones & Bartlett.

Watson Genna, C. (2017). *Supporting sucking skills in breastfeeding infants* (3rd ed.). Sudbury (MA): Jones & Bartlett.

Wilson-Clay, & B., Hoover, K. (2017). *The Breastfeeding Atlas* (6th ed.). LactNews Press.



A centralized source of high quality, evidence-informed, reliable resources that align with the Baby-Friendly Initiative (BFI).

Visit: www.breastfeedingresourcesontario.ca

Appendix A

Average Weight Gain of a Breastfed Infant

The chart below describes the acceptable parameters for weight loss/gain in the first two weeks. If concerns are identified, remember:

- Decisions regarding infant feeding should not be made based on weight alone.
- Assess the whole situation, not just the weight. Weight is only one sign of how well an infant is doing.
- Each infant follows their own unique weight gain pattern and may have fluctuations on their growth curve. Regular weight and length/height measurements over time will show a child's special growth pattern (Dietitians of Canada, 2014).
- Assess weight gain from the infant's lowest weight during the first few weeks rather than infant's birth weight (Mohrbacher, 2010).



Age of infant	Expected weight outcome	Reference
First 3-4 days after birth	<ul style="list-style-type: none"> • May lose on average 7-8% of birth weight. • Typically reach lowest weight within 3-4 days of delivery. 	DiTomasso et al., 2017; Flaherman et al., 2017; Paul et al., 2017; Thulier, 2017
Days 4-6	<ul style="list-style-type: none"> • Starts to show a pattern of regular weight gain. 	ABM, 2014
Days 10-14	<ul style="list-style-type: none"> • Regain birth weight, however some may take up to 2-3 weeks to surpass birth weight. 	ABM, 2014; Paul et al., 2016

Weighing infants:

- The infant should be weighed naked on a calibrated beam or preferably an electronic scale.
- The scale should be accurate and reliable with a maximum weight of 20 kg, in 1 or 10 g increments, easily “zeroed” and recently calibrated (Dietitians of Canada, 2014).
- Consecutive weight monitoring, preferably on the same scale, will ensure an accurate growth picture.

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Average weight gain in the first year

Remember weight gain is only one of many variables that indicate how well an infant is developing.

Infant's Age	Average Weight Gain	
0-4 months	170 - 240 g per week	6 - 8.5 oz. per week
	25 - 35 g per day	0.9 - 1.2 oz. per day
4-6 months	95 - 140 g per week	3.4 - 5.0 oz. per week
	15 - 20 g per day	0.5 - 0.7 oz. per day
6-12 months	55 - 90 g per week	2.0 - 3.2 oz. per week
	10 - 15 g per day	0.35 - 0.6 oz. per day

These averages are based on the WHO Child Growth Standards. To assess average weight gain, weight-per-age percentile charts for birth to five years were used. The range is a combination of boys and girls 3%-97%, rounded to the nearest five grams.

According to the WHO Child Growth Standards, an infant's weight will:

- Double between 3-6 months.
- Triple between 9-18 months.

Appendix A – Key Resources

Dietitians of Canada. (2014). A health professional's guide for using for WHO growth charts for Canada. www.dietitians.ca/Downloads/Public/DC_HealthProGrowthGuideE.aspx

Dietitians of Canada. (2014). WHO Growth Charts. www.dietitians.ca/Dietitians-Views/Prenatal-and-Infant/WHO-Growth-Charts.aspx

Penn State Hershey Medical Centre. (2019). Newborn Weight Tool. www.newbornweight.org

The WHO Multicentre Growth Reference Study (MGRS): Rationale, planning and implementation. www.who.int/childgrowth/mgrs/fnu/en/

Appendix A – References

Dietitians of Canada. (2014). *A health professionals guide for new growth charts*. Retrieved from: www.dietitians.ca/Downloads/Public/DC_HealthProGrowthGuideE.aspx

DiTomasso & D., Paiva, A. (2017). Neonatal weight matters: An examination of weight changes in full-term breastfeeding newborns during the first 2 weeks of life. *Journal of Human Lactation*, 1-7.

Flaherman, V., Schaefer, E., Kuzniewicz, M., Sherian, L., Walsh, E., & Paul, I. (2017). Newborn weight loss during birth hospitalization and breastfeeding outcomes through age 1 month. *Journal of Human Lactation*, 33(1), 225-230.

Mohrbacher, N. (2010). *Breastfeeding answers made simple a guide for helping mothers*. Amarillo (TX): Hale Publishing.

Paul, I., Schaefer, E., Miller, J., Kuzniewicz, M., Li, S., Walsh, E., & Flaherman, V. (2017). Weight change nomograms for the first month after birth. *Pediatrics*, 138(6).

Thulier, D. (2017). Challenging expected patterns of weight loss in full-term breastfeeding neonates by caesarean. *Journal of Obstetrical, Gynecological and Neonatal Nursing*. 46(1),18-28.

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