

Protocol #12

Insufficient Breast Milk Supply



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“Not enough milk” is one of the most common worries of new mothers and reasons given for early discontinuation of breastfeeding. It is rarely related to a maternal physical condition but is more frequently related to inadequate removal of breast milk from the mother’s breast. There may be low breast milk supply or a misunderstanding of the baby’s feeding behaviour; it may be actual or perceived. Ultimately, the question becomes “Is the baby getting enough breast milk?”

Observation and Assessment

1. The baby may have one or more signs that may indicate a problem of inadequate breast milk intake.

Assess the baby for:

- Absence of effective sucking and swallowing at the mother’s breast (e.g., few or no deep and slow sucks).
- Inadequate urine and stool output (*Protocol #3: Signs of Effective Breastfeeding*).
- A loss of more than 7% of birth weight in the first 3 days of life.
- Inadequate weight gain. A weight gain of less than 20–35 g ($\frac{2}{3}$ – 1¼ oz) per day for the first 3 – 4 months of age (after the initial weight loss in the first 3 days of life and showing a pattern of gaining by 5 days of life). Breastfed babies 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. (*Protocol #3: Signs of Effective Breastfeeding*).
- Birth weight that is not regained by 10 days of age.
- Possible lethargy, irritability, and/or breast refusal. However, some babies with inadequate weight gain may mistakenly appear to have a personality that is content and placid.
- Signs of dehydration, e.g., sunken fontanelle, sunken eyes, dry mucus membranes, poor skin turgor, ketonic odour, uric acid crystals (*Protocol #3: Signs of Effective Breastfeeding*).

2. The mother may have one or more signs that may indicate a problem with **actual low breast milk supply or lactation failure**.

Assess the mother for:

- No signs of the breast milk ejection or letdown reflex. Mothers may not recognize a letdown reflex unless they feel it but may recognize when the baby’s sucks change from shallow and quick to deep and slow (*Protocol #3: Signs of Effective Breastfeeding*).
- No breast changes after birth (e.g., no breast engorgement or breast milk coming in).
- No breast changes during pregnancy (e.g., no tenderness, darkening of the areola, enlargement, or leaking).
- No or minimal breast changes during puberty.
- One breast that is markedly different in size and/or shape from the other.
- Unusually shaped breasts or widely spaced breasts, e.g., cone shaped breasts (Wilson-Clay, 2008).
- Breast injury, surgery, or biopsy in which major nerves and ducts in the mother’s breasts are damaged, e.g., burns to the mother’s breast, breast reduction with incisions to the areola and/or nipple. Breast implants usually do not affect breast milk supply.
- History of fertility concerns or metabolic conditions, e.g., diabetes, thyroid, polycystic ovary syndrome (PCOS).
- Loss of sensation in the mother’s breast.

Possible Contributing Factors or Causes

Assess the baby for:

- Delay in the initiation of breastfeeding after birth (*Protocol #1: The Initiation of Breastfeeding*).

- Ineffective positioning and latching (*Protocol #2: Positioning and Latching*).
- Medical conditions that may compromise the baby's suck (e.g., jaundice, dehydration, hypertonia/hypotonia, cleft lip/palate, abnormal tongue, birth trauma) (*Protocol #10: Ineffective Suck* and *Protocol #14: Jaundice in a Breastfed baby*). The baby needs to be assessed by a primary health care provider to rule out any medical condition.
- Ineffective or weak suck (*Protocol #10: Ineffective Suck*).
- Inadequate frequency and duration of breastfeedings (*Protocol #3: Signs of Effective Breastfeeding*).
- Supplementation (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).
- Use of bottles and pacifiers.

Assess the mother for:

- Knowledge of normal lactogenesis (breast milk production) and infant feeding and sleep behaviours.
- Ineffective breastfeeding management, e.g., infrequent breastfeeding, inadequate breast milk removal.
- Lack of confidence in her ability to breastfeed.
- Supplementation for inadequate breast milk supply or perceived inadequate breast milk supply (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).
- Engorgement lasting for more than 48 hours (*Protocol #5: Engorgement*).
- Uncontrolled pain.
- Significant stress.
- Delayed Lactogenesis II due to postpartum or intrapartum complications (e.g., lengthy labour, birth interventions, postpartum hemorrhage, retained placenta, Sheehan's syndrome (pituitary insufficiency due to severe blood loss and shock during childbirth). (see *Protocol #10: Ineffective Suck* regarding birth interventions).
- Maternal medical conditions that may delay or decrease breast milk supply, e.g., diabetes, anemia, hypertension, untreated hypothyroidism, pituitary disorders.
- Use of herbs and medications that decrease breast

milk supply (e.g., sage, contraceptives containing estrogen, ergot alkaloids, thiazide diuretics, cold preparations such as decongestants) (Hale, 2010).

- Cigarette smoking.
- Excessive alcohol consumption.
- Acute dehydration or excess fluid intake.
- Use of a pacifier to delay breastfeedings.
- Pregnancy.
- Congenital insufficient glandular tissue (see *General Principles*).
- Breast injury, surgery, or biopsy in which major nerves and ducts in the mother's breasts are damaged (e.g., burns to the mother's breast, breast reduction with incisions to the areola and/or nipple). Breast implants usually do not affect breast milk supply.

Suggestions

1. Assess whether the mother has a perceived or an actual insufficient breast milk supply. If the exclusively breastfed baby has adequate urine and stool output and is gaining weight well, offer reassurance to the mother that she does have sufficient breast milk supply.
2. Reassure her that the following signs do not indicate an insufficient breast milk supply:
 - Fussiness with adequate weight gain (*Protocol #11: Crying and Colic in the Breastfed Baby*).
 - Frequent breastfeedings (at least 8 times within 24 hours).
 - Increased breastfeedings during a growth spurt. Growth spurts may occur at any time. These are commonly described as occurring at, but are not limited to, 10 days to 2 weeks, 6–8 weeks, 3 months, and later (Lauwers et al., 2011).
 - Cluster breastfeedings. These are periods when the baby breastfeeds frequently, followed by periods when the baby sleeps longer between breastfeedings. These are most common in the late afternoon and evening.
 - Baby takes a bottle after breastfeeding (many babies will suck on anything even if they are full because they find sucking pleasurable).
 - Breasts that normally soften 10–14 days after birth due to the mother's breasts adjusting to the baby's needs.

- Lack of sensation when the letdown reflex occurs, or a decreased letdown reflex sensation. The mother should also look for other signs of the letdown reflex such as when the baby's sucks change from shallow and quick to deep and slow.
- Breasts that have little or no leaking.
- Mother reports expressing no breast milk or only a small amount of breast milk.

If the mother is assessed to have an actual insufficient breast milk supply, assess for possible cause(s) for this condition (see the previous section on *Possible Contributing Factors or Causes*).

3. If the baby is showing signs of inadequate weight gain, the baby needs to be assessed by a primary health care provider to rule out any possible medical condition such as jaundice, dehydration, urinary tract infection, hypertonia/hypotonia, cleft lip/palate, abnormal tongue, or birth trauma.

- If the baby has an ineffective suck, refer to *Protocol #10: Ineffective Suck*.

- If the mother's breasts are engorged, refer to *Protocol #5: Engorgement*.

4. If breastfeeding management is assessed to be ineffective or not optimal, offer suggestions to optimize breastfeeding management (*Protocol #3: Signs of Effective Breastfeeding*). It is always appropriate for the breastfeeding to be assessed and optimized.

5. If the baby is showing signs of failure to thrive, the baby needs to be referred to a primary health care provider for further assessment and monitoring. Immediate supplementation may be medically indicated if the baby is truly failing to thrive (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).

- Offer information to the mother so that she can recognize and observe signs of slow weight gain as differing from failure to thrive (see chart below)

<i>Slow weight gain</i> Gains weight slowly and consistently	<i>Failure to thrive</i> Very low, erratic, or no weight gain
<ul style="list-style-type: none"> • alert, responsive, healthy appearance • normal muscle tone • good skin turgor • pale, diluted urine, 6 or more times/day • frequent seedy stool, or infrequent large stool • breastfeeding well • 8 or more breastfeedings/day • good suck • good letdown reflex • weight gain consistent but slow 	<ul style="list-style-type: none"> • apathetic, lethargic, or weak cry • poor muscle tone • poor skin turgor • concentrated “strong” urine, few times/day • infrequent scant stools • difficult or ineffective breastfeeding, often from birth • fewer than 8 breastfeedings/day, usually brief • may have poor suck • no signs of functioning letdown reflex • poor or erratic weight gain (\leq 3rd percentile or crosses down two percentile lines); may lose weight

(Adapted from Giuliani, 2002, and Lawrence, 2010)

6. If the mother is assessed to have an actual insufficient breast milk supply, then provide her with suggestions to increase her breast milk supply.

Before breastfeeding, encourage the mother to:

- Follow early feeding cues to breastfeed frequently (*Protocol #3: Signs of Effective Breastfeeding*).
- Ensure that the letdown reflex is initiated. The baby's rooting, sucking and hands on the mother's breasts are the natural stimuli for letdown when breastfeeding is initiated early, before the baby is overly hungry and begins crying (see early feeding cues in *Protocol #3: Signs of Effective Breastfeeding*).

The mother can try the following ideas to initiate letdown:

- Breastfeed in a quiet, relaxed place.
- Use relaxation strategies, such as a warm shower, heat applied to her back and shoulders, relaxation breathing, a warm drink, supportive positions.
- Manage pain to support, comfort, and relax to facilitate breast milk letdown.
- Initiate breastfeeding early, before the baby is stressed and crying.
- Clothe the baby in only a diaper to promote skin-to-skin contact.
- Support the baby in a vertical chest-to-chest position, with the nose approaching the mother's nipple, to facilitate the baby's reflexes and self-attachment behaviours.
- Gently massage her breasts. 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 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. Then gently express some breast milk (*Protocol #19: Expressing and Storing Breast Milk*).
- Stimulate the nipples. Gently roll her nipples between the index finger and thumb for several minutes or until the letdown reflex occurs. Then gently express some breast milk (*Protocol #19: Expressing and Storing Breast Milk*).

During breastfeeding, encourage the mother to:

- Breastfeed frequently—at least 8 times a day, including at least once overnight, if the baby is younger than 6 months old.

- Dress the baby in a diaper only when breastfeeding to promote skin-to-skin contact.
- Use effective positioning and latching practices (*Protocol #2: Positioning and Latching*).
- Ensure that the baby is sucking and swallowing effectively at each breastfeeding.
- Offer both breasts at each feeding to increase stimulation to the mother's breasts.
- Try “switch nursing” if the baby is sleepy or loses interest quickly. Offering each breast 2–3 times during a feeding to keep the baby interested as the baby's sucking slows down, can help to optimize the amount of time the baby actively sucks and swallows. The term “switch nursing” has been used by La Leche League leaders (LLLI, 2011).
- If the baby breastfeeds on only one side, encourage the mother to express some breast milk from the other breast. This will ensure that both breasts are stimulated at each feeding.
- Use breast compressions to help stimulate sucking and swallowing (see *Protocol #5: Engorgement* for a description of breast compressions).
- Feed the baby only breast milk for the first 6 months of life unless supplementation is medically indicated (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).
- Breastfeed the baby first, then offer solid foods once the baby has begun taking solid foods. Breast milk is the primary source of nutrition.

Note: Mothers are advised to exclusively breastfeed their babies to 6 months of age and to introduce nutrient-rich solid foods, with particular attention to iron, at 6 months, with continued breastfeeding for up to 2 years and beyond (TPH, 2010).

After breastfeeding, encourage the mother to:

- Eat and drink according to *Eating Well With Canada's Food Guide* (Health Canada, 2007).
- Avoid using bottles and pacifiers.
- Avoid smoking, alcohol, and caffeine.
- Express both breasts after breastfeeding to increase stimulation to the mother's breasts (*Protocol #19: Expressing and Storing Breast Milk*).
- Get help from family and friends with cleaning, cooking, caring for the baby, caring for other children.

If the baby is unable to breastfeed effectively, encourage the mother to:

- Express each breast after each time that the baby is unable to breastfeed effectively. If breastfeeding is stopped for any length of time, encourage the mother to express each breast regularly in order to maintain her breast milk supply. Generally, this should be at least 8 times in 24 hours, with a minimum of 1 expression overnight, to mimic the normal pattern of feeding. The mother may need to express more often if her breasts become uncomfortable or overly full (*Protocol #19: Expressing and Storing Breast Milk*).
- Feed the baby with expressed breast milk using an alternative feeding method, e.g., cup, spoon, syringe, finger feeding, lactation aid on the mother's breast. Using a lactation aid on the mother's breast is recommended over the other alternative feeding methods if the baby is able to latch onto the mother's breast. This method allows the baby to remain at the mother's breast and provides the mother's breasts with stimulation (*Protocol #18: Alternative Feeding Methods*). If expressed breast milk is not available and it is assessed that supplementation is medically indicated, then an appropriate supplement should be offered (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).
- Consult a breastfeeding expert or breastfeeding clinic for further assessment as soon as possible.

If the mother and baby are unresponsive to non-pharmacological strategies to optimize breast milk supply and the mother inquires about the use of a galactagogue, encourage her to:

- Understand the possible benefits and risks associated with the use of galactagogues if she inquires about using such medications or herbs for managing an insufficient breast milk supply. It is important that mothers be aware of this information in order to make a fully informed decision about the use of galactagogues. Offer further assessment and refer for further support as needed (see notes in *General Principles*).
- Continue to support strategies that optimize breastfeeding.
- Mothers should consult a breastfeeding expert or breastfeeding clinic.

Before the use of galactagogues is considered, it is essential to optimize all non-pharmacological measures to optimize breastfeeding management, including a thorough breastfeeding assessment. If the mother inquires about using a galactagogue to increase breast milk supply, it is important to first explore with her any possible underlying causes of insufficient breast milk supply. It is also important to inquire about her current breastfeeding management practices and attempts to manage her breast milk supply, and then offer suggestions to optimize basic breastfeeding management and to support her in making a fully informed decision.(see *General Principles*).

7. If the mother has had breast surgery such as augmentation or reduction mammoplasty, breast injury, or is suspected of having congenital insufficient glandular tissue, she should be referred to a breastfeeding expert or breastfeeding clinic for a thorough assessment. She should be encouraged to attempt breastfeeding, as full or partial lactation is often possible.

General Principles

A common concern that mothers have in the early postpartum period is that they do not have enough breast milk for their baby. This is one of the most common reasons given by mothers for discontinuing breastfeeding or for supplementing with artificial baby milk.

It is often the case that insufficient breast milk supply is a perceived and not an actual problem. This may be due in part to a lack of knowledge regarding normal infant behaviours and cues, and the normal process of breastfeeding, e.g., growth spurts, clusters, and frequent breastfeedings.

Riordan defines insufficient breast milk as “insufficient breast milk production to sustain normal infant weight gain despite appropriate breastfeeding routines, maternal motivation to continue breastfeeding, and skilled assistance with breastfeeding problems” (Riordan, 2010).

Very few mothers experience actual insufficient breast milk supply if breastfeeding is appropriately managed from birth (*Protocol #1: The Initiation of Breastfeeding*).

Insufficient breast milk supply that is permanent and irreversible can be caused by congenital insufficient glandular tissue, or breast injury, surgery, or biopsy in which the major nerves and ducts in the mother's breasts are damaged, e.g., burns to the mother's breast or breast reduction with incisions to the areola and/or nipple. Breast implants usually do not affect breast milk supply. Mothers with breast injury or surgery may be able to breastfeed exclusively, whereas women with true congenital insufficient glandular tissue will need to use supplementation with breastfeeding (*Protocol #17: Indications for Supplementation or Cessation of Breastfeeding*).

It is rare for a woman to be born with congenital insufficient glandular tissue. This condition is referred to as primary lactation failure and is due to the underdevelopment of the alveoli (breast milk producing cells) and lactiferous ducts. A mother with this condition will often report that she experienced no changes to her breasts during pregnancy or after birth, e.g., no enlargement, tenderness, or breast milk coming in. Each breast may also be markedly different in size and/or shape, with one breast being much larger than the other. One or both breasts may also be unusually shaped, e.g., cone shaped.

Slow weight gain/failure to thrive/inadequate breast milk intake – Low intake of breast milk means low caloric intake, which compromises weight gain, height, and most significantly head circumference. In turn these have been associated with compromised development and cognition.

Galactagogues

If the mother inquires about the use of medications or herbs to increase breast milk supply, it is important to first explore with her any contributing factors related to insufficient breast milk supply, as well as her breastfeeding self-efficacy. It is also important to inquire about her previous breastfeeding history, current breastfeeding management and attempts to manage her insufficient breast milk supply, and then offer suggestions to optimize basic breastfeeding before introducing further interventions (see notes above).

If she is unresponsive to non-pharmacological measures to enhance breast milk supply, refer her to a breastfeeding expert or breastfeeding clinic. Before using any substance to increase breast milk supply a thorough assessment of breastfeeding, including breast milk supply and breast milk transfer, is essential. There continues to be limited

data in the form of controlled trials regarding the use of medications and herbs as galactagogues to establish standardized dosages, to determine the mechanism of action, efficacy and potential risks for the baby, or possible interactions with other medications. There is a lack of rigorous evaluations and standardizations (Zuppa et al., 2010). A frequently cited study by Swafford and Berens that reported a significant increase in breast milk volume with use of fenugreek was only an observational study of 10 women, and was not published beyond a conference abstract (Swafford et al., 2000). The updated Protocol of the Academy of Breastfeeding Medicine reports that emerging data suggest more caution be exercised in recommending galactagogues than in its previous edition (ABM, 2011). Both the Academy of Breastfeeding Medicine *Protocol #9* (2011) and Lawrence (2011) include appendices that present the current “minimal specific data” known for common galactagogues (ABM, 2011).

Galactagogues should not be the first strategy recommended to manage an insufficient breast milk supply and they should only be initiated by a health care provider who has the breastfeeding expertise to thoroughly assess the potential effectiveness and risks of use for the breastfeeding pair. The practitioner is also responsible for establishing a plan with the mother for the ongoing management and evaluation of the intervention. Practitioners who do not have the capacity, i.e., lactation expertise or time, to continue to support the dyad appropriately should refer the mother to a breastfeeding expert or breastfeeding clinic.

It is important that mothers be aware of this information in order to make an informed decision as well as how to monitor themselves and the baby for possible side effects. See the Academy of Breastfeeding Medicine's *Protocol #9: Use of Galactagogues in Initiating or Augmenting Maternal Milk Secretion* (ABM, 2011) (*Protocol #16: Drugs and Breastfeeding*).

Health Canada has regulations to ensure the quality, effectiveness, and safety of natural health products (herbs). Natural health products approved under these regulations will have a Natural Product Number (NPN) or Drug Information Number – Homeopathic Medicine (DIN-HM) on the label. Few products have been tested for safety in pregnancy and breastfeeding and are thereby not recommended by Health Canada for use in breastfeeding.

Other messages about the use of herbs and natural remedies are mixed. According to Riordan, the use of herbs to stimulate breast milk production is “extraordinarily common today”; however, scientific evidence for their use is minimal (Riordan, 2010). Many herbal remedies have been used throughout history to enhance breast milk supply. Most have not been scientifically evaluated but traditional use suggests safety and possible efficacy (ABM, 2011). In the absence of scientific studies on herbs in lactation, many lactation experts turn to the work of Sheila Humphrey (2003). Humphrey has developed a body of information about the use of herbs in lactation, but it does not include controlled studies.

Riordan also advises practitioners to honour cultural practices as well as to advise mothers that herbs may have pharmacological effects on their baby.

At this time there is not enough scientific information about the safety of various herbs and natural health products to recommend their general use during breastfeeding. Breastfeeding women should use natural products with caution and always consult with their health care provider with breastfeeding expertise.

Medications that may increase breast milk supply (galactagogues): Refer mothers to a health care provider with breastfeeding expertise.

Domperidone (Motilium) is a medication that may increase breast milk supply by stimulating the production of prolactin. It is traditionally used to treat disorders of the gastrointestinal tract. The evidence for use of domperidone as a galactagogue, although limited, is the strongest available evidence, with a few small sample size controlled trials (Da Silva, 2004; Wan, 2008; Campbell-Yeo, 2010). Recommendation as a galactagogue is considered “off label” use in Canada. The American Food and Drug Administration (FDA) has warned against the use of domperidone by lactating women. The FDA warnings were based on reports of increased risk of cardiac arrhythmia and sudden death in patients receiving high-dose intravenous domperidone concurrently with chemotherapy. In this case it was used as an antiemetic, not a galactagogue. Domperidone does not easily pass the blood-brain barrier (Zuppa, 2010; Lawrence, 2011). Da Silva notes that only a minimal amount of domperidone passes into breast milk and is ingested by the infant, and advises that the use of domperidone is appropriate for lactating women

with low breast milk supply who are unresponsive to non-pharmacological measures (Da Silva, 2004). Wan et al. (2008) found that domperidone only increased the breast milk supply in about two-thirds of mothers. Hale (2010) states it is the ideal galactagogue and rates it as L1. A prescription is required.

It is essential that mothers be aware of the risks associated with high dosages as well as other side effects, along with the benefits of domperidone, when making a decision to use it. Side effects of domperidone in the mother include dry mouth, skin rash, itching, headache, thirst, abdominal cramps, diarrhea, and drowsiness (Hale, 2010).

Metroclopramide (Maxeran) is a medication that is also used to increase breast milk supply, although its primary use is as a gastrointestinal stimulant. Not all women respond to it and the effects are dose dependent. Hale rates it as L2. Side effects that include fatigue, irritability, and depression may limit compliance (Hale, 2010). It is known as Reglan in the USA. A prescription is required.

Herbs that may increase breast milk supply (possible galactagogues): Refer mothers to a breastfeeding expert or breastfeeding clinic.

Fenugreek and blessed thistle are two herbs that have been traditionally recommended by some breastfeeding experts for increasing breast milk supply without apparent adverse effects. Hale rates both fenugreek and blessed thistle as L3 or moderately safe (Hale, 2010). This expert opinion is based on clinical observation, including anecdotal evidence. Currently there are no clinical trials to establish efficacy or dosage, risks to the mother or baby, or possible interactions with other medications. Other herbs that have been used traditionally include borage, goat’s rue, milk thistle (*Silybum marianum*), dandelion, millet, oats, anise, basil, marshmallow and others (ABM, 2011). Herbs may be included in traditional foods for breastfeeding mothers.

Breastfeeding women should consider the use of herbs and natural health products with caution and always consult with their health care provider with breastfeeding expertise.

There are no clinically determined or standardized safe dosages:

- Hale suggests a dosage of fenugreek of 6 grams per day (Hale, 2010). Lawrence suggests a usual dosage as 1–4 capsules (580–610 mg) 3–4 times a day, or

a cup of tea (¼ tsp seeds crushed in 8 oz water) 3 times a day, although there is no standardized dose (2010).

- Hale says blessed thistle lacks justification as a galactagogue, although he does state that it is virtually nontoxic (2010). Lawrence says it is not a galactagogue and is confused with milk thistle (2011). There have been reported concerns related to allergic reactions (Hale, 2010) and lowering of blood sugar. He suggests an adult dose of 1.5 to 3 grams in tea up to 3 times a day. At this time both Health Canada and Medline advise against the use of blessed thistle in breastfeeding women due to a lack of reliable research and limited safety information.

Mothers may also find information about the use of galactagogues available on the Internet. This may include information from Thomas Hale, a

pharmacist with expertise related to medications and breastfeeding at:

- Thomas Hale's website for parents:
<http://www.infantrisk.com/category/breastfeeding>.

See also handouts from Dr. Jack Newman, who has been a pioneer in supporting breastfeeding mothers with information about galactagogues:

- Domperidone:
<http://www.breastfeedingonline.com/Dom19abcombinedpdf.pdf>.
- Herbs for increasing milk supply are discussed in his handout "Miscellaneous Treatments" available from: <http://www.breastfeedingonline.ca/content.php?pagename=doc-HRMS>

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