



Department of Education and
Early Childhood Development

Promoting Breastfeeding

Victorian Breastfeeding
Guidelines



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This is a substantial update of the 1998 Victorian Breastfeeding Guidelines, which were originally based on the Royal Women's Hospital Breastfeeding Protocol.

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Victorian Breastfeeding Guidelines for health professionals

Breastfeeding is the biological way of providing infants and young children with the nutrients required for optimum growth and development. Australian and international guidelines recommend that infants be exclusively breastfed until around six months of age, and that mothers continue breastfeeding with the addition of appropriate complementary foods for up to two years or beyond.

Victorian women receive perinatal care from a range of health professionals that include midwives, general practitioners, nurses, obstetricians, paediatricians, and maternal and child health nurses. Women often describe breastfeeding information and advice as inconsistent. These guidelines are a source of evidence-based breastfeeding information for health professionals to use when working with women and their families during the continuum of breastfeeding.

The Victorian Breastfeeding Guidelines are designed to be used in conjunction with the National Health and Medical Research Council, Infant Feeding Guidelines – Information for Health Workers (2012). For some breastfeeding conditions the Victorian Breastfeeding Guidelines will provide detailed advice and guidance that will be a concise and useful resource for health professionals.

In this major revision of the previous Victorian Breastfeeding Guidelines we sought advice from health professionals and consumers about the inclusion of other topics and more detailed guidance about these topics. So, although these guidelines are primarily applicable for mothers and healthy full term babies, other common aspects of breastfeeding care are now included.

All sections of the revised Victorian Breastfeeding Guidelines have been updated and include information on:

- How breastfeeding works – updated physiology
- Breastfeeding advice during pregnancy
- Establishing breastfeeding – guidance for best practice
- Routine breastfeeding assessment – for mother and baby
- Infant-related breastfeeding issues – including care of mothers establishing breastfeeding when their infants are preterm and care of the late preterm baby in the maternity setting
- Alternative methods of infant feeding when breastfeeding is not possible including infant formula feeding, donor milk and breastmilk banks
- Continuing breastfeeding including breastfeeding and sexuality and return to paid employment while continuing breastfeeding
- Websites about pregnancy and parenting
- Community support and information services.

1 Introduction

1.1 Background

1.1.1 Purpose

The purpose of the Victorian Breastfeeding Guidelines is to protect, promote and support breastfeeding in Victoria. They are a readily accessible, concise guide for health professionals who work with pregnant and breastfeeding women.

Women receive perinatal care from a range of health professionals that include midwives, general practitioners, nurses, obstetricians, paediatricians, and maternal and child health nurses. Women often describe breastfeeding information and advice as inconsistent [1]. These guidelines are a source of evidence-based breastfeeding information for health professionals to use when working with women and their families during the continuum of breastfeeding. Provision of breastfeeding information and advice may commence during prenatal counselling and continue until the child has ceased breastfeeding.

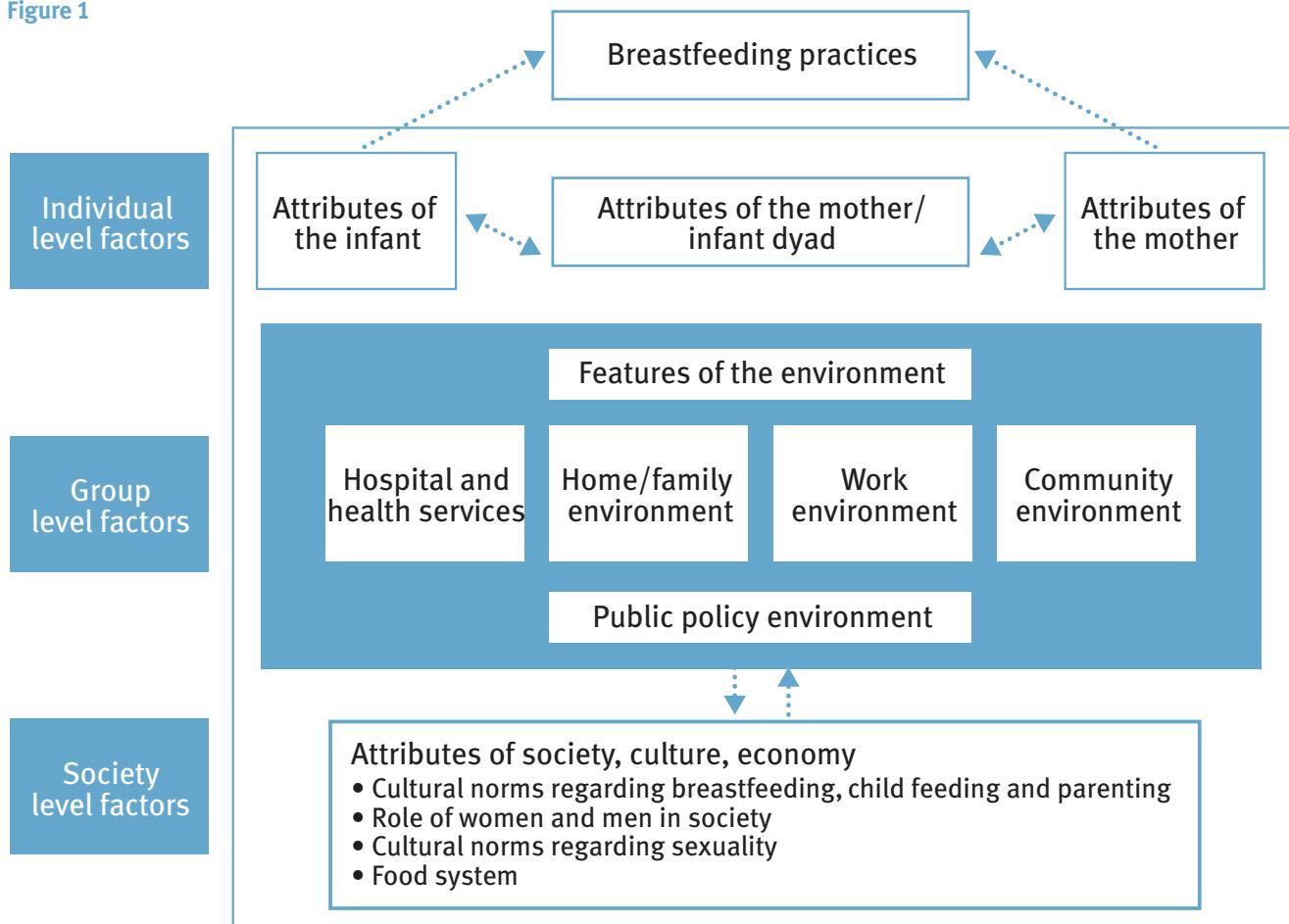
In Victoria, public maternity hospitals self-report compliance with the Baby Friendly Health Initiative (BFHI) “10 Steps to Successful Breastfeeding” as part of their Maternity Services Performance Indicators [2]. These indicators are a means of monitoring how hospitals are supporting initiation and maintenance of breastfeeding. Many hospitals in Victoria have also sought external assessment for BFHI accreditation. These guidelines, therefore, include the principles of care that are embedded in the BFHI.

1.1.2 Breastfeeding and health

Breastfeeding is the biological way of providing infants and young children with the nutrients required for optimum growth and development. Australian and international guidelines recommend that infants be exclusively breastfed until around six months of age, and that mothers continue breastfeeding with the addition of appropriate complementary foods for up to two years or beyond [3].

Breastfeeding initiation and duration rates are variable and influenced by the circumstances of the mother and her infant. Many factors affect breastfeeding practices, including the influence of family and health professionals, as depicted by Hector *et al.*[4] (See Figure 1).

Figure 1



Source: 'A conceptual framework of factors affecting breastfeeding practices' in Hector *et al.* [4] (p. 53)

1.1.3 The importance of breastfeeding

Health professionals should provide all new mothers and their families with appropriate information regarding the risks of not breastfeeding.

Using evidence from recent reviews [5-9], we have summarised the risks of not breastfeeding (see Sulaiman *et al.* [10] for further details). The strongest evidence has been rated as ✓✓✓ (or ‘convincing’). Where reviews have concluded that the evidence is ‘probable’, we have given ✓✓, and ‘possible’ ✓. For some conditions, the reviews are unanimous in rating the risk as convincing; for example, the risk of neonatal necrotizing enterocolitis in preterm infants and the risk of breast cancer in pre-menopausal women. For other conditions (e.g. Sudden Infant Death Syndrome), the reviews concluded the strength of evidence ranged from ‘convincing’ to ‘possible’, so we have combined the spectrum of these two ratings to give our rating of ✓✓.

Table 1: Summary of risks associated with not breastfeeding

Health conditions	Strength of evidence	Reference
Infant – Short term		
Neonatal necrotising enterocolitis	✓✓✓	[5, 6]
Gastrointestinal infection or diarrhoea	✓✓✓	[5-8]
Otitis media	✓✓✓	[5-8]
Respiratory tract infection	✓✓✓	[5-8]
Asthma and allergy	✓✓	[5, 6, 8]
Eczema	✓✓	[6, 8]
SIDS*	✓✓	[5, 6, 8]
Infant – Long term		
Childhood and adolescent obesity	✓✓	[5, 8, 9]
Higher adult mean blood pressure	✓✓	[7-9]
Adult type-2 diabetes	✓✓	[5-9]
Childhood leukaemia	✓✓	[5, 7, 8]
Cognitive ability or intelligence level	✓✓	[5-9]
Inflammatory bowel disease	✓✓	[5, 7, 8]
Childhood and adolescent type-1 diabetes	✓	[5, 8]
Higher mean adult blood cholesterol level	✓	[6, 9]

Mother – Short term		
Slow return to pre-pregnancy weight	✓	[5, 6]
Postpartum depression	✓	[5, 6]
Mother – Long term		
Premenopausal breast cancer	✓✓✓	[5-8]
Postmenopausal breast cancer	✓✓	[5]
Ovarian cancer	✓✓	[5-8]
Rheumatoid arthritis	✓✓	[5, 8]
Endometrial cancer	✓	[5]
Osteoporosis	✓	[5, 6]

✓✓✓ = ‘convincing’; ✓✓ = ‘probable’; ✓ = ‘possible’.

*level of evidence ranges from ‘convincing’ [6] to ‘possible’ [8]

1.1.4 Baby Friendly Health Initiative and the International Code of Marketing of Breastmilk Substitutes (The WHO Code)

The Baby Friendly Health Initiative (BFHI) is a joint initiative by UNICEF and the World Health Organization (WHO) launched in 1991. It aims to protect, promote and support breastfeeding worldwide. In Australia, many hospitals have sought external assessment to become BFHI or ‘Baby Friendly’ accredited facilities [11]. BFHI accredited hospitals are able to demonstrate they comply with The Ten Steps to Successful Breastfeeding [12] (Table 2) and the *WHO International Code of Marketing of Breast-milk Substitutes and subsequent World Health Assembly (WHA) resolutions* [13] (Table 3).

The Commonwealth Department of Health has an Advisory Panel on the Marketing in Australia of Infant Formulas (APMAIF). This panel monitors the Marketing in Australia of Infant Formulas: Manufacturers and Importers Agreement (MAIF Agreement).

The MAIF Agreement is a voluntary, self-regulatory code of conduct for manufacturers and importers of infant formula in Australia. It sets out the obligations of manufacturers in and importers to Australia of infant formulas and gives effect in Australia to the principles of the World Health Organization’s International Code of Marketing of Breast Milk Substitutes (WHO Code) [14]. Importantly, the MAIF Agreement does not implement all aspects of the WHO Code. It does not include other milk products, foods, beverages or feeding bottles/teats. Only manufacturers and importers are signatories; retail activities are excluded. In addition, the MAIF Agreement refers to ‘health care professionals’, whereas the WHO Code applies to a broader ‘health worker’ group.

Table 2: The Ten Steps to Successful Breastfeeding [11]

Every facility providing maternity services and care for newborn infants should:

Step 1	Have a written breastfeeding policy that is routinely communicated to all health care staff
Step 2	Train all health care staff in skills necessary to implement this policy
Step 3	Inform all pregnant women about the benefits and management of breastfeeding
Step 4	Place all babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognise when their babies are ready to breastfeed, offering help if needed
Step 5	Give newborn infants no food or drink other than breastmilk, unless medically indicated
Step 6	Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants
Step 7	Practice rooming-in, allow mothers and infants to remain together – 24 hours a day
Step 8	Encourage breastfeeding on demand
Step 9	Give no artificial teats or dummies to breastfeeding infants
Step 10	Foster the establishment of breastfeeding support and refer mothers on discharge from the facility

Table 3: WHO International Code of Marketing of Breastmilk Substitutes and subsequent WHA resolutions summary [15]

The Code applies to breastmilk substitutes, when marketed or otherwise represented as a partial or total replacement for breastmilk and includes these important provisions:

1. Advertising	No advertising of infant formula products to the public
2. Samples	No free samples to mothers, their families or health care workers
3. Health care facilities	No promotion of products to the public No company mothercraft nurses to advise mothers No gifts or personal samples to health workers; e.g. diaries No free or low-cost supplies to be given
4. Information	No words or pictures idealising artificial feeding, including pictures of infants on the labels of products Information to health workers should be scientific and factual
5. Labels	All information on artificial infant feeding, including the labels, should explain the benefits of breastfeeding, and the costs and hazards associated with artificial feeding
6. Products	Unsuitable products, such as sweetened condensed milk, should not be promoted for babies. All products should be of high quality and take account of the climatic and storage conditions of the country in which they are to be used

Australia is currently working towards adopting the 7 Point Plan for the Protection, Promotion and Support of Breastfeeding in Community Health Services (Table 4). Community facilities will soon be able to become accredited as ‘Baby Friendly’ Community Health Services.

Table 4: 7 Point plan for the protection, promotion and support of breastfeeding in community health services [11]

7 Point Plan for the Protection, Promotion and Support of Breastfeeding in Community Health Services

Point 1	Have a written breastfeeding policy that is routinely communicated to all staff and volunteers
Point 2	Educate all staff in the knowledge and skills necessary to implement the breastfeeding policy
Point 3	Inform women and their families about breastfeeding being the biologically normal way to feed a baby, and about the risks associated with not breastfeeding
Point 4	Support mothers to establish and maintain exclusive breastfeeding for six months
Point 5	Encourage sustained breastfeeding beyond six months with appropriate introduction of complementary foods
Point 6	Provide a supportive atmosphere for breastfeeding families, and for all users of the service
Point 7	Promote collaboration between staff and volunteers, breastfeeding support groups and the local community in order to protect, promote and support breastfeeding

1.2 How breastfeeding works

A sound knowledge of the anatomy and physiology of the lactating breast is essential for the health practitioner to assist with breastfeeding support and management. Structures of the breast include mammary tissue, the nipple and areola, supporting connective tissue, fat, blood and lymphatic vessels, and nerves.

1.2.1 Breast anatomy

Composition of mammary tissue

- Lobules, which are made up of clusters of alveoli (small sacs) consisting of milk-secreting cells known as lactocytes. These are surrounded by muscle (myoepithelial) cells, which contract and propel the milk along the ducts.
- An intertwined system of milk ducts, which merge into main collecting ducts close to the nipple. Ultrasound studies have found these ducts to be ‘small, superficial and easily compressed’ [16, 17] and that they do not display lactiferous sinuses nor store large amounts of milk, as previously thought [18].

Nipple and areola

- Within the nipple are ducts that open as pores at the nipple tip; an average of nine ducts were seen in ultrasound studies (number ranged from 4 to 18)[19] whereas more are seen on dissection – an average of 24 (range 5 to 50) [20].
- The nipple also contains muscle fibres and nerves.
- The circular pigmented area around the nipple is known as the areola, in which the Montgomery’s glands are located.
- During pregnancy and lactation the Montgomery’s glands secrete an oily fluid that protects the skin of the nipple and areola.

Supporting connective tissue and fatty tissue

- The breast is composed of both glandular and fatty tissue supported by a framework of ligaments known as Cooper's ligaments.

Lactation cycle

Mammogenesis

In early pregnancy, under the hormonal influence of oestrogen, progesterone, placental lactogen and prolactin, the ductal system of the breast branches and extends, with significant growth of the lobes and the formation of multiple alveoli. This is usually associated with an increase in breast size and breast tenderness.

Secretory differentiation (previously known as Lactogenesis I) [21]

Secretory differentiation occurs in mid- to late pregnancy when 'the differentiation of the mammary epithelial cells into lactocytes occurs, conferring the ability to synthesize and secrete the unique fats, proteins and carbohydrates that are present in human milk' [22 p. 89]. Thus, by mid-pregnancy, colostrum may be present in the alveoli and milk ducts, however high levels of circulating progesterone prevents copious milk production.

Secretory activation (previously known as Lactogenesis II) [21]

Secretory activation is triggered by the withdrawal of progesterone following birth, in particular following the removal of the placenta, and by high levels of circulating prolactin. Milk secretion is copious and occurs between 24–102 hours (average 60 hours) after the birth [23]. This is often described as the milk 'coming in.'

1.2.2 Hormonal (endocrine) control of lactation

When an infant feeds at the breast, stimulation of nerve endings in the nipple and areola occurs, sending impulses along the sensory pathways to the brain. In response to this stimulation, prolactin is released from the anterior lobe of the pituitary gland and oxytocin from the posterior pituitary lobe. These are the two main hormonal influences that directly affect breastfeeding.

Prolactin

Following birth, the effect of circulating prolactin is no longer blocked as the levels of progesterone and oestrogen rapidly fall. Prolactin stimulates the alveoli in the breasts to synthesise milk. The infant's suckling stimulates the release of prolactin with the highest levels in the mother's blood approximately 30 minutes after a feed has commenced, thus stimulating milk production for the next feed.

Oxytocin

Oxytocin from the posterior pituitary gland is released when stimulation of the nerve endings in the nipple and areola occurs (with feeding or expressing), or when a mother is anticipating that her infant needs to feed. This reflex, known as the 'milk ejection reflex', can also be triggered by the mother's sensations and feelings, such as touching, smelling or hearing her infant cry.

Oxytocin acts on myoepithelial cells of the alveoli causing them to contract, forcing milk that has collected in the alveoli to flow into the ducts and out through the nipple pores. Oxytocin also acts on the uterine muscles, causing them to contract after the birth, helping to control bleeding. In the first few days after birth, these contractions may be painful when an infant feeds; they are often referred to as 'afterpains'.

Signs of an active oxytocin reflex

‘Mothers may notice some but not all of the following signs that show that the oxytocin reflex is active:

- A tingling sensation in the breast before or during a feed
- Milk flowing from her breasts when she thinks of the baby or hears him crying
- Milk flowing from the other breast when the baby is suckling
- Milk flowing from the breast in streams if suckling is interrupted
- Slow deep sucks and swallowing by the baby, which show that milk is flowing into his mouth
- Uterine pain or a flow of blood from the uterus
- The mother may feel thirsty during a feed’ [24 p. 12]
- Often mothers will only be aware of the initial let-down reflex and may not be aware of subsequent let-downs during a feed [17].

1.2.3 Autocrine control of lactation

Once lactation is established, an autocrine control (local feedback) mechanism regulates ongoing milk production. Feedback Inhibitor of Lactation (FIL) is a whey protein produced by the lactocytes; its presence in breastmilk influences milk production [25]. When milk accumulates in the breast, higher levels of FIL are associated with reduced milk secretion. Conversely, when the breast contains less milk, less FIL is present; this is associated with increased milk secretion from the lactocytes. FIL enables the amount of milk produced to be determined by how much the infant takes, and therefore by how much the infant needs [22].

Therefore, whilst prolactin enables milk secretion to take place, it does not completely control the amount of milk produced [24]. This local feedback control is important for the ongoing production of milk once prolactin levels decrease and it accounts for individual variation in milk production between the two breasts, and enabling a woman to breastfeed from one breast only.

1.2.4 Breast storage

‘The storage capacity of breasts varies and impacts upon the length and frequency of breast feeds. Breast milk storage capacity of mothers can range from approximately 80 ml to as much as 600 ml. Breast capacity of mothers cannot be determined by visual assessment. Large breasts may contain increased adipose tissue, rather than mammary tissue. The baby of a mother with a smaller storage capacity will feed more frequently than a baby of a mother with a larger storage capacity to receive the same amount of milk in a day. Rules about number and length of feeds are avoided; however, most healthy babies will feed between eight to twelve times in a twenty-four hour period.’ [26 p. 9]

Individual variability

There is considerable variation between mothers and infants regarding:

- Storage capability of the mother’s breast
- Volume of milk intake
- Rate of milk transfer flow
- Nature of mouth/breast positioning
- Changes in milk composition during a feed.

Advice should be tailored to each mother and her infant, rather than imposing arbitrary rules on positioning, frequency and length of feeds.

2 Breastfeeding advice during pregnancy

Healthcare professionals providing maternity care should discuss, with the woman and her support partner, the normality of breastfeeding, the importance of breastfeeding for the health of mother and infant, how breastfeeding is maintained and the risks of artificial infant formula.

Healthcare professionals need to be aware of and be able to direct women to professional and lay support within the local community and the hospital setting. Research has demonstrated that support is effective in the establishment of breastfeeding and contributes to increased duration of breastfeeding [27].

Women and their support partners should be encouraged to learn about breastfeeding during pregnancy and to seek out specific breastfeeding education classes and Australian Breastfeeding Association local groups during the second/ third trimesters.

2.1 Baby Friendly Health Initiative antenatal education and discussion

The Baby Friendly Health Initiative recommends that antenatal education and discussion should extend throughout the antenatal period and cover the following key points [28]:

- Why breastfeeding is important
- The risks associated with not breastfeeding
- The importance of early uninterrupted skin-to-skin contact and the first feed
- Why 24-hour rooming-in (staying close to baby) is important
- Why bottle teats and dummies are discouraged while breastfeeding is being established
- Exclusive breastfeeding for the first six months and that breastfeeding continues to be important after six months, when other foods are introduced
- Basic breastfeeding and lactation management, including positioning and attachment, feeding cues and frequency of feeding
- Indications that a baby is getting enough milk
- Maintaining and increasing breastmilk supply
- Breastfeeding support groups and services in the community.

It may be helpful to explore the following with the mother:

- Support from her partner, family and friends regarding breastfeeding
- Her plans for return to work or study
- Any concerns she may have about breastfeeding.

Mother's history

Discussions regarding the health history of the pregnant woman should include:

- Previous breastfeeding experience and duration of breastfeeding
- Nipple and breast size, variations and shape
- Any previous breast surgery (e.g. biopsy, augmentation, reduction, nipple piercing)
- Any previous breast injury
- Any chronic diseases or medical conditions
- Regular medications including complementary and over-the-counter medications
- Use of tobacco, alcohol or illicit drugs.

Examination of the breasts and nipples

The size and shape of the breasts or nipples are not indicative of breastfeeding outcomes; however, some risk factors for successful breastfeeding have been identified [29]. During pregnancy, clinicians should sensitively perform an examination of the woman's breasts and nipples. However, many women are not accustomed to having their breasts examined and verbal consent should be obtained prior to examination. The following should be noted:

- Breast hypoplasia or very large breasts
- Nipple variations such as inversion
- Presence of breast lumps and/or scar tissue
- Nipple eczema or dermatitis
- Nipple piercing including scars from previous piercing [30].

2.2 Referral for additional support during pregnancy

Women who have experienced previous difficulties with breastfeeding, or who may have risk factors for breastfeeding challenges such as diabetes, obesity, multiple pregnancy, nipple variations and previous breast surgery, should be referred to a lactation consultant or community breastfeeding support service for antenatal consultation and ongoing breastfeeding support postpartum. There is no evidence to support routine nipple preparation during pregnancy [31].

2.3 Antenatal breastmilk expression

Health professionals in some countries including Australia have commenced advising women at risk of early lactation problems to express breastmilk antenatally [32, 33]. The aim of antenatal expressing is for a woman to have a store of breastmilk in case her infant develops hypoglycaemia or the woman's milk supply is insufficient soon after birth, possibly avoiding the use of artificial infant formula in the early postnatal period [32].

However, only two pilot studies have been conducted on the efficacy and safety of antenatal expressing [34, 35], and therefore further research is required before women should be routinely advised to express antenatally. It should be noted that a multi-centre randomised controlled trial designed to determine the safety and efficacy of antenatal expressing has commenced recruitment (Australia and New Zealand Clinical Trial Registry; DAME (Diabetes and Antenatal Milk Expressing) Trial Number: 12611000217909) [36].

2.4 Considering breastfeeding in specific circumstances

Contraindications

There are very few absolute contraindications to breastfeeding, as documented in the WHO/UNICEF [37] Acceptable Medical Reasons for Use of Breastmilk Substitutes. (See Appendix 1.) Some contraindications to breastfeeding may be short-term, so breastfeeding can be supported while the woman expresses, and temporarily discards her breastmilk. Acute herpes infection of the nipple/areola of a mother with a newborn baby would be an example of temporary contraindication to breastfeed. Other conditions may require monitoring of the mother and infant while the condition continues or until it is resolved.

Maternal addiction

Even in situations of tobacco, alcohol and illicit drug use, breastfeeding remains the feeding method of choice for the majority of infants, but may be contraindicated in individual cases.

HIV-infected mothers

According to WHO, when replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS), avoidance of all breastfeeding by HIV-infected mothers is recommended [38]. In Australia it is considered that infant formula is AFASS, so women in Australia are generally advised not to breastfeed if they are HIV-positive [39]. Mixed feeding (breastfeeding and infant formula) is not recommended as this is associated with an increased risk of HIV transmission to the infant [40].

Many factors affect the establishment of breastfeeding such as the birth, gestation, health of mother and infant and maternity care practices. This section will focus on best practice for the well mother and infant while being cared for in maternity settings, including early care at home postnatally.

3 Establishing breastfeeding

3.1 Skin-to-skin contact

Skin-to-skin contact following birth involves placing the naked infant prone on the mother's bare chest at birth or within a few minutes of birth. The infant should be left undisturbed for at least one hour and until after the first breastfeed. All mothers should be encouraged to place their infants in skin-to-skin contact, regardless of mode of birth, unless prevented by a medical reason such as illness or significant prematurity. Procedures such as 'head to toe' checks, weighing, bathing, and administration of Vitamin K to the infant should be delayed until after the first feed. Infants who are placed in skin-to-skin contact with their mother at birth, regardless of birth mode, usually display behaviours that encourage breastfeeding [26].

Benefits of skin-to-skin contact for the mother include [41]:

- Stimulation of oxytocin release resulting in
 - minimisation of blood loss
 - reduced anxiety
 - enhanced mother–infant emotional attachment
- May prevent or alleviate breastfeeding problems (e.g. engorgement, sore nipples)
- Longer duration of breastfeeding.

Benefits of skin-to-skin contact for the infant include [41]:

- Helps maintain body temperature and normal blood glucose levels
- Decreases length of time crying
- Enhanced mother–infant emotional attachment
- Innate behaviours encouraged
- Early establishment of effective suckling.

The level of supervision and observation required for the mother and infant during skin-to-skin contact is dependent upon:

- Mode of birth
- Level of consciousness of mother
- Health status of mother and infant [26] (see Table 5).

Table 5: Factors influencing supervision requirements for skin-to-skin contact (adapted from [26])

Woman	Infant
Mode of birth: <ul style="list-style-type: none">• Emergency caesarean section• Assisted delivery	<ul style="list-style-type: none">• Intrapartum risk factors• Known or suspected underlying medical condition• Any other identified risk
Medications: <ul style="list-style-type: none">• Narcotics administered in last 5 hours• Sedation administered in last 4 hours• Identified illegal drug use	
Underlying medical condition of mother: <ul style="list-style-type: none">• Extended labour• Maternal fatigue• Obesity• Any other identified risk	

'If risk factors [are] identified, documented direct supervision should be provided during skin-to-skin contact. A partner or relative may consent to provide direct supervision of skin-to-skin contact in some circumstances. Indirect supervision by health professionals requires frequent visual observations of baby.'[26].

The midwife should show the mother how to safely position her infant whilst in skin-to-skin contact to ensure a clear airway. The mother should be advised to observe the baby's colour and muscle tone (by lifting the baby's arm and gently releasing it) and to call the midwife immediately if the baby appears pale or dusky, or has poor muscle tone.

3.2 The first breastfeed

Innate feeding behaviours

"In skin-to-skin contact the baby usually demonstrates the following well-defined sequence of innate behaviours [42]:

- Opens eyes, quietly looks around and searches for mother's nipple
- Uncurls fists and makes grasping movements toward nipple
- Makes small 'licking' movements
- Demonstrates 'rooting' behaviour which may include:
 - opening mouth
 - turning head towards the nipple
 - nuzzling chin into breast
 - attempting to self-attach" [26 p. 7].

The instinct to suck is especially strong soon after birth and this can establish a pattern for future feeds. When possible, the infant should be allowed to seek the breast and attach spontaneously within the first 1–2 hours of life. Delaying procedures such as weighing, measuring and Vitamin K administration enhance the early parent–infant interaction [43]. While the mother and infant are in skin-to-skin contact after birth, encourage the mother to interest the infant in sucking by:

- Holding the infant skin-to-skin between her breasts
- Letting him/her nuzzle and mouth the nipple
- Allow him/her to suck at the breast once interest is aroused
- If the infant does not attach for a breastfeed, keep mother and infant skin-to-skin if possible and try again at least every one or two hours until successful [28, 44]
- If the infant does not breastfeed within the first two hours of birth, express and give colostrum by cup, dropper or spoon [45].

It is important that the breastfeed is not interrupted by routine procedures until the infant indicates satiety by:

- Spontaneously detaching from the nipple without further rooting behaviour
- Falling asleep at the breast [26, 46, 47].

Extra support when mothers are initiating breastfeeding

Women who have had complicated births such as caesarean section, postpartum haemorrhage or third/fourth degree tears may require extra support in initiating skin-to-skin contact and breastfeeding due to pain, reduced mobility and the effects of the birth and pain relief. To ensure the comfort of the mother, and thus an efficient let-down reflex, assistance and education should be provided to minimise pain through:

- Facilitating a comfortable breastfeeding position
- Appropriate and effective analgesia
- Offering full assistance and support as needed.

Events during labour and birth may have a significant influence on lactogenesis. Explanation and reassurance should be given to mothers that supportive measures will overcome most challenges [48].

3.3 The natural pattern of breastfeeding

States of readiness for breastfeeding

Usually breastfeeding is initiated in response to feeding cues from the infant. Understanding the states of alertness can be helpful in identifying when infants are ready to breastfeed [26, 49 p. 221]. See Table 6.

Table 6: Infant states of alertness – (Adapted from [26])

Behavioural state	Feeding cues	Readiness to feed
Deep sleep – not easily roused	None	No
Light sleep – rousable but likely to fall back to sleep	None	No
Drowsy – yawning, eyes opening intermittently	Early – wiggling, moving arms and legs, rooting, fingers to mouth, licking	Early – yes
Quiet alert – looking around, regular breathing, body still	Early – wiggling, moving arms and legs, licking, searching.	Early – yes
Active alert – moving arms and legs, sensitive to environment	Mid – fussing, squeaky noises, restless, hand to mouth, stretching	Mid – yes
Crying – agitated, disorganised, needs comforting	Late – full cry, colour turns red	Late – no

Feeding according to need/infant-led feeding

Research indicates there are wide variations in infant feeding patterns, maternal milk production and breast storage capacity. Therefore “breastfed infants should be encouraged to feed on demand, day and night, rather than conform to an average that may not be appropriate for the mother–infant dyad” [50 p. e387]. There are advantages for mother and infant when feeding according to need/demand feeding patterns is followed (Table 7).

Table 7: Reasons for feeding according to need [23, 26, 51]

Mother	Infant
Increases the rate of successfully establishing lactation	Increases breastfeeding duration
Reduces the incidence of breast engorgement	Decreases the incidence and severity of physiological jaundice
Establishes a supply and demand pattern	

When a healthy infant born at term is feeding effectively there should be no restrictions on:

- Frequency of feeding
- Duration of feeds
- Night feeds [26, 52].

Early breastfeeding patterns

Many infants have a period of deep sleep for several hours following the first feed after birth, and then increased interest in feeding. During this time infants may feed frequently in a cluster-like pattern [53]. Prolonged periods of not feeding require investigation; specific guidance regarding frequency and length of feeds should be reserved for infants who are not feeding well.

Most healthy infants who are feeding effectively will feed between eight to twelve times in a twenty-four hour period. Research indicates that total length of time at each breast does not correlate with amount of milk transferred [50]. Kent *et al.* found that most infants (57%) will take one breast at some feeds and both breasts at others, while some infants will only ever take one breast at each feed (30%) and others will always take both breasts (13%) [23].

If the infant is breastfeeding well, the mother should breastfeed on the first breast and then offer the second breast when the:

- Infant detaches spontaneously
- Infant appears to have finished the first breast
- Mother feels the first breast is softer
- Infant refuses the first breast but continues to display feeding behaviours [46].

Sucking patterns

Both non-nutritive and nutritive sucking occur throughout a breastfeed [54]. Table 8 describes the differences in sucking. It is important for mothers to be able to recognise effective feeding and the difference between the sucking patterns.

Table 8: Sucking descriptions [26]

Non-nutritive sucking	Nutritive sucking
Rapid and shallow	Deeper and slower
2 sucks per second	Approximately 1 suck per second
Infrequent swallows	Swallows after every 1 or 2 sucks
Occurs with periods of slow milk flow: at the beginning of a feed prior to a milk ejection	Occurs with periods of rapid milk flow: after a milk ejection

Let-down reflex (milk ejection reflex, MER)

‘MER (also known as ‘let-down’) is the expulsion of breastmilk from the alveoli into the milk ducts and is hormonally controlled.

It is important to note that:

- MER will usually occur a number of times during a feed
- Most mothers will only be aware of the initial MER and may not be able to sense subsequent milk ejections
- Many mothers experience a sensation of warmth or tingling in their breasts
- Some mothers experience ‘afterbirth’/abdominal pain or discomfort during MER
- Some mothers are unaware of the MER
- Changes in the baby’s sucking pattern throughout the feed will indicate that MER is occurring (nutritive sucking).

Maternal anxiety or hyper-alert states may influence the MER’ [26 p. 10].

The sucking process

Reflexes in the infant

‘The baby’s reflexes are important for appropriate breastfeeding. The main reflexes are *rooting*, *suckling* and *swallowing*. When something touches a baby’s lips or cheek, the baby turns to find the stimulus, and opens his or her mouth, putting his or her tongue down and forward. This is the *rooting reflex* and is present from about the 32nd week of pregnancy. When something touches a baby’s palate, he or she starts to suck it. This is the *sucking reflex*. When the baby’s mouth fills with milk, he or she swallows. This is the *swallowing reflex*’[24].

Preterm infants have capacity to grasp the areola and nipple from about 29 weeks’ gestational age, and they can suckle and remove some milk from about 31 weeks. Coordination of suckling, swallowing and breathing develops between 32 and 35 weeks and full breastfeeding may be attained between 32 and 38 weeks [55].

The World Health Organization states that when health professionals are supporting a mother and baby to initiate and establish breastfeeding, it is important they understand the maturation of these reflexes, as this will guide whether an infant can breastfeed directly, or temporarily requires another feeding method [24].

Sucking action

Geddes and colleagues have described removal of milk from the breast in terms of vacuum applied by the infant, as in the following description [56]. When the infant sucks, the areola and nipple press upward against the upper gum and the hard palate. The negative pressure of the infant’s suck transfers milk with much greater milk flow when the tongue is down than when the tongue is up. The negative pressure, along with the alternative compression and release of the gums, move the milk through the milk ducts and out the nipple. When the infant’s jaw drops, the increased negative pressure allows the milk to move from the nipple to the infant’s mouth [56]. In contrast, Woolridge argues that compression of the breast and peristalsis of the infant’s tongue play an important role in milk removal [57]. Recent 3D ultrasound images confirm that infants’ tongues move both up and down and with a peristaltic motion even within the same feed [58]. Further research is needed to clarify the relative contributions of peristalsis and negative pressure in removal of milk from the breast [58].

Swallowing

Swallowing is an important sign of effective breastfeeding and milk transfer that reassures both the mother and the health professional:

- ‘Swallowing sounds are normally subtle, with a quiet “cuh” sound
- With a new milk ejection, swallowing may become slightly louder and more frequent’ [26 p. 10].

3.4 Exclusive breastfeeding

Australian NHMRC *Infant Feeding Guidelines for Health Workers* (2012) recommend that infants are breastfed exclusively until around six months of age when solid foods are introduced [39]. WHO and UNICEF global recommendations for optimal infant feeding as set out in the *Global Strategy for Infant and Young Child Feeding* (2003) are:

- Exclusive breastfeeding for 6 months
- Nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond [3].

Exclusive breastfeeding means that an infant receives only breastmilk from his or her mother or a wet nurse, or expressed breastmilk, and no other liquids or solids, not even water, with the exception of oral re-hydration solution, drops or syrups consisting of vitamins, minerals supplements or medicines [59].

Supplementary feeds of infant formula, water or glucose water should only be given for medical indications, such as, but not limited to, those listed in the WHO Acceptable Medical Reasons for Use of Breastmilk Substitutes (Appendix 1), or at the mother's informed documented request [37].

Dummy (pacifier) use for breastfeeding infants

It is recommended not to use a dummy for a healthy, term breastfed infant until breastfeeding is well established [60]. Dummies have been associated with shortened breastfeeding duration, otitis media and dental malocclusion and may contribute to breastfeeding difficulty. However, dummies have been used for pain relief for infants undergoing procedures or for preterm infants during tube feeding [61]. ‘Frequent use of dummies may negatively impact upon breastfeeding by decreasing the number of breastfeeds in a day. This may reduce milk supply and slow baby’s weight gain’ [26 p. 8].

When women are considering using a dummy it would be reasonable to discuss that it might have an impact on breastfeeding and that it is important to offer a breastfeed before offering the dummy. Recommendations regarding dummy use:

- Avoid the use of dummies if possible especially while establishing lactation
- Always breastfeed before offering a dummy especially when establishing breastfeeding.

As some evidence suggests that dummies may reduce the incidence of sudden infant deaths, the American Academy of Pediatrics suggests that parents “consider offering a pacifier at nap time and bedtime. . . For breastfed infants, delay pacifier introduction until breastfeeding has been firmly established, usually by 3 to 4 weeks of age” [62 p. 1034].

3.5 Positioning and attachment at the breast

Effective positioning and attachment of an infant for breastfeeding is essential for establishing and maintaining breastfeeding. It is a learnt skill and can take time for the mother–infant dyad to establish. Some infants will move to position themselves at the breast while other infants will be assisted by the mother to achieve a position for breastfeeding that will be comfortable for both mother and infant [63]. Many midwives adopt the ‘hands off’ approach to assisting mothers as they are learning to breastfeed [64]. This can provide the mother the opportunity to practice breastfeeding while being verbally guided by a skilled professional [65].

Positioning

The following principles are relevant regardless of the mother's choice of breastfeeding position:

'Mother is positioned enabling her baby to have easy access to the breast. Consider

- Mother's comfort, including adequate pain relief for post birth pain
- Privacy
- Baby's position. Baby is held close to the mother's body at the same level of the breast with:
 - whole body turned towards the mother
 - trunk and head aligned
 - mouth at nipple level
 - head slightly tilted back with support from across back and the shoulders, not the head' [26 p. 8].

Signs of effective attachment

Nipple sensitivity and tenderness is common in the first few days. However, painful breastfeeding is abnormal and may indicate ineffective attachment.

'Signs of effective attachment include:

- A baby that looks comfortable, relaxed and is not tense, frowning/grimacing with:
 - mouth open wide against the breast with the nipple and surrounding breast tissue included in the gape
 - chin against the breast
 - observed deep jaw movements
 - cheeks not sucked in
 - swallowing that can be seen/heard once the milk ejection reflex (MER) occurs
- After feeding nipples will appear slightly longer but should not be flattened, white or ridged.

If signs of effective attachment are not present, or poor attachment is suspected (e.g. the above signs are not present), the mother should be advised to detach the baby by sliding her finger into the corner of baby's mouth between his/her gums which will:

- Cause baby to release the breast
- Enable removal of the breast from baby's mouth.

Mother can then reattach baby using positioning principles' [26 p. 8].

Infant-led attachment

Often mothers and their infants find it easier to learn how to breastfeed by using an infant-led or biological nurturing style of attachment [63]. This allows mother and infant to work together and use natural reflexes to assist with attachment and breastfeeding.

The mother leans back slightly and holds the infant in close to her chest and breasts following her natural body contour. Her infant is positioned chest to chest with his/her mouth on the breast close to the nipple. The mother is able to support, stroke and calm her infant. The infant is able to mouth, lick and smell the breast. These behaviours lead to latching onto the breast, sucking and swallowing breastmilk through an active and nutritional feed.

Some mothers are more comfortable sitting and bringing their infant up to the breast in a cross-chest hold. The infant is still able to be held securely and the infant's mouth, nose and upper lip can be lined up to the mother's nipple and breast. The mother may need to shape her breast to help the infant attach with a good mouthful of breast tissue and not just the nipple.

The mother will often feel a gentle tugging on her breast and nipple. If she describes pain, the attachment is usually incorrect and the infant needs to be carefully detached and the process started again.

Following a Caesarean birth

Women may be shown how to breastfeed while lying on their side when recovering from surgery. In the immediate post-surgery period, a mother who may be drowsy, drug-affected and immobile should be closely monitored by staff or their support person during breastfeeds. In these circumstances, it is recommended the infant should be returned to the cot when the breastfeed is completed.

For women who have had a caesarean birth, breastfeeding in a lying-back position may reduce stress on the incision site. In this position, the infant's legs can be angled to reduce pressure or irritation on the incision.

Side-lying position for breastfeeding

In the side-lying position for breastfeeding, the mother is:

- Lying on her side, with her head and neck supported. Some women may need back support and/or a pillow between their legs for additional support [66].
- Her infant tucked in close to her with the infant's nose in line with her nipple, also lying on his side. Some mothers do support their infant's head with their arm; others find it more comfortable to use their lower arm for their own support. Sometimes a pillow to help support the infant may be used. This should be placed close to infant's bottom and lower back, NOT close to infant's head.
- The mother can use her upper arm to shape and guide the breast as her infant gapes open the mouth to attach.
- When feeding in a side-lying position, it is important that the mother change which side she is laying on for feeding.

Key points to help a mother achieve good positioning and attachment or latch include:

- Encourage the mother to bring the infant in close and hold securely
- The infant's chest is touching mother's chest and breast
- The infant's chin is touching mum's breast/lower areola
- The infant's nose and/or upper lip is touching mother's nipple.

Assessing milk transfer at a breastfeed

No one aspect should be used as the only assessment tool for adequate intake of an infant. It is important to observe a full breastfeed in order to be able to observe appropriate milk transfer. Each infant needs to be assessed individually, including:

- Feeding frequency per 24 hours according to gestational age
- Quality of breastfeeds – sucking patterns according to stage of lactation
- Length of time of breastfeed, effectiveness of the milk ejection reflex, swallowing of milk seen or heard
- Weight gain
- Urinary and bowel output
- Infant and maternal behaviour during the feed.

A number of breastfeeding assessment tools are available, such as the LATCH breastfeeding assessment tool [67], which provide objective evidence that assists the health professional and the mother evaluate the effectiveness of a particular breastfeed and are useful in recognising that breastfeeding is progressing well (see Table 9).

Table 9: LATCH breastfeeding assessment tool [67]

Score	0	1	2
L Latch	Too sleepy No latch achieved	Repeated attempts Hold nipple in mouth, stimulate to suck	Grasps breast Tongue down Lips flanged rhythmic sucking
A Audible swallowing	None	A few with stimulation	Spontaneous and intermittent < 24 hours old Spontaneous and frequent > 24 hours old
T Type of nipple	Inverted	Flat	Everted (after stimulation)
C Comfort (breast/ nipple)	Engorged Cracked, bleeding, large blisters, or bruises Severe discomfort	Filling Reddened/small blisters or bruises Mild/moderate discomfort	Soft/tender
H Hold	Full assist (staff holds baby at breast)	Minimal assist (i.e. elevate head of the bed, place pillows for support) teach one side, mother does other Staff holds and then mother takes over	No assist from staff Mother able to position/ hold infant

'Add the score obtained from each row in LATCH. If the baby scores less than 7 for a feed, this is an indicator for further evaluation and/or development of a breastfeeding management plan' [26 p. 17].

3.6 Where the infant sleeps

3.6.1 Rooming-in

Rooming-in should be encouraged as it is associated with the following benefits [68, 69]:

- Unrestricted breastfeeding access
- Increased breastfeeding duration
- Increased opportunity for mothers to become familiar with their infant's feeding cues, behaviour and feeding patterns prior to discharge
- Promotion of relaxation and sleep for mother and infant
- Reduced risk of SIDS [70].

3.6.2 Bed-sharing and co-sleeping

Many cultures consider co-sleeping and bed-sharing as the normal way to care for their infant. The terms ‘bed-sharing’ and ‘co-sleeping’ are often interchanged so it is important to be able to discuss with the parents what they intend to do for their infant, bearing in mind the interchangeability of the terminology of infant sleeping arrangements. Sensitivity to cultural differences must always be considered when discussing the parents’ intentions.

Definitions [71]

Bed-sharing	Refers to bringing baby onto a sleep surface when co-sleeping is possible, whether intended or not
Co-sleeping	May be defined as a mother and/or her partner (or any other person) being asleep on the same sleep surface as the baby
Room-sharing	Refers to sleeping the baby in a cot or other separate sleeping surface in the same room as the parents

Recent studies have shown that bed-sharing is a risk factor for SIDS even if parents are non-smoking and breastfeeding [72]. Parents should be informed that it is safer to sleep infants under three months in their own cot [72]. Room-sharing has also been shown to be protective of SIDS [73]. SIDS and KIDS recommend sleeping baby in their own sleeping space in the same room as an adult care-giver [74]. Bed-sharing and co-sleeping have been associated with benefits for breastfeeding, such as increased maternal touching and looking, increased breastfeeding, and faster and more frequent maternal responses [75].

3.7 Monitoring the infant’s progress

Infant’s weight and output

To ensure mother and infant are progressing well it is important to be able to objectively identify if the infant is getting enough breastmilk, and be aware of risk factors for delays in lactogenesis II. ‘Is baby getting enough?’ is a concern often cited by mothers and their families and remains a major reason that women wean [76] or introduce infant formula. Health professionals should be able to address the mother’s concerns and reassure her if the insufficiency is perceived rather than real. In situations where the mother has actual breastmilk insufficiency the cause should be identified and feeding managed accordingly.

The breastfed infant is adapted to take only small amounts of colostrum until the milk ‘comes in’ at about 60 hours [23]. In hospital, the infant is weighed at birth and usually on discharge from the maternity service. Infants have an average weight loss of between 5–7% of their birth weight in the first few days, peaking at day 3 and starting to put on weight by day 8. Clinicians should be watchful of weight loss between 7–10% and intervene when weight loss is > 10% [77].

Factors associated with increased weight loss in the newborn period include:

- Primiparous mothers
- Maternal obesity
- Maternal epidural use
- Higher infant birth weight
- Female infant
- Delayed first breastfeed
- Having uric acid crystals in the nappy [78-80].

The amount and timing of maternal intravenous fluids (IV) appears to be correlated with infant fluid and weight loss. Infants of women having larger volumes of peri-partum IV fluids were more likely to demonstrate greater urine output and infant weight loss in the first three days [81]. Infant weight loss information is a valuable tool for infant assessment as it may help identify poor breastfeeding, poor maternal milk supply or infant morbidities. However, weight loss should neither be the only assessment tool, nor the sole indicator for clinical decisions. Weight loss, output, infant behaviour and feeding assessments are equally important and should be completely evaluated.

Identifying risk factors for excess weight loss may help direct care to mothers who need extra support while establishing breastfeeding.

Many hospitals now routinely care for late preterm infants in the maternity ward rather than the neonatal unit. These are infants who should be carefully observed for adequacy of breastmilk intake, behavioural states, urine and stool output and weight loss. Adequacy of breastfeeding can be assessed by considering a number of factors (see Table 10) [23, 82, 83].

Table 10: Early input/output checklist: adapted from [26]

Age	Volume of breastmilk/day (24 hours)	Feeds/day	Urine per day	Number of stools	Stool colour	Stool consistency	Infant weight
Day 1 (0–24 hours)	0–5 ml colostrum at first feed 7–123 ml colostrum per day	3–8	1 concentrated May contain urates		Black	Tarry/sticky	
Day 2 (24–48 hours)	increasing volumes	5–10	2–3 concentrated may contain urates	1–2	Greenish/black	Softening	
Day 3 (48–72 hours)	increasing volumes	5–10	3–4 paler, but may concentrated and may contain urates	3–4	Greenish/yellow	Soft	Less than 10%
Day 4 (72–96 hours)	395–800 ml	5–10	4–6 pale No urates	4–10 large to small	Yellow/seedy	Soft/liquid	Between day 4–6 begins to gain weight
Day 5 >96 hours	increasing volumes	8–12	>6 pale urine	4–10 large to small	Yellow/seedy	Soft/liquid	

By 2 weeks of age most infants will have returned to birth weight.

Infants will have an average weekly weight gain of:

- 150–200 grams to 3 months of age
- 100–150 grams 3–6 months of age
- 70–90 grams 6–12 months of age [39].

A healthy, thriving exclusively breastfed infant older than 4–6 weeks may have stools only a few times a week or less [49 p. 272]. It is important that they maintain 4–6 heavy wet disposable nappies per 24 hours.

Weight gain or loss is only one aspect of infant wellbeing to consider; every mother and infant should be assessed on an individual basis.

It is also important to observe and plot key growth determinants (factors). These include:

- Number of breastfeeds that have observable milk transfer (see LATCH tool in Attachment and Positioning section)
- Adequate output – urinary and stools according to age and stage of lactation
- Periods of content sleep
- Periods of alert, calm wakefulness
- Weight increase
- Length increase
- Head circumference increase.

Key points to remember:

- Infants need to feed often, especially in the early weeks; around 8–12 breastfeeds in 24 hours, not necessarily evenly spaced throughout the day.
- The infant will vary the feeds according to his/her needs and the rate of milk transfer.
- ‘Demand feeding’ allows infants to let mothers know their needs.
- Infants will know when they are hungry so feeding can be done to suit the infant’s needs.
- In some cases infants may need to be woken to be breastfed, especially if they are not gaining the minimum required weight.
- Infants may become unsettled and want to feed more often from time to time.
- Feeding times vary from feed to feed and infant to infant.
- As infants get older and are able to suck more efficiently, they often have shorter feeds and may sleep longer between some feeds or be awake and content.
- Breastmilk is easily digested, and most infants want and need to be fed frequently especially as the gastric emptying time of human milk is shorter than for artificial formula [84].
- Re-assess the breastfeed with the mother if an infant is feeding longer than 30 to 45 minutes.
- It is fine to give infants an extra breastfeed or breastfeed ‘top-up’ to settle him/her when needed.
- Encourage mothers to let an infant feed for as long as the infant wants to. Some infants will pause during a breastfeed and then start sucking again; usually the infant decides when to come off the breast.

4 Routine breastfeeding assessment

4.1 History and examination

Routine breastfeeding assessment includes a medical and breastfeeding history, and assessment of a breastfeed. The following is a guide that may be used for all routine breastfeeding assessments [85, 86]. Further questions should be based on the presenting problem and the history given.

4.1.1 History

Maternal

Psychosocial/social

- Does the woman have other children? If so, how many?
- Previous breastfeeding history
- Family history of breastfeeding
- Desire to and personal feelings about breastfeeding
- Support already engaged/helpful/not helpful
- Attitudes and views of family and friends to breastfeeding.

Physical

- Relevant medical history including breast disease or surgery
- Birth history for this baby including complications
- Medical complications related to the birth
- Current breastfeeding history including breast changes in pregnancy
- Current medications
- Allergies.

Infant

Physical

- Gestation at birth
- Birth weight
- Current age
- Current weight
- Weight gain/loss history
- Urinary output – frequency/colour/odour/volume
- Stool output – frequency/consistency/colour
- Medical history
- Any medications.

Feeding history

- Feed frequency
- Duration of feeds (minutes)
- Feeding pattern:
 - from one or both breasts at each feed or a combination
 - active/sleepy/tires easily/stops and starts

- Sucking – strong/weak/disinterested/pulls on and off/gulping/coughing
- If expressing:
 - frequency
 - pump use – manual/electric/double
 - volumes obtained.
- If supplementing:
 - type of milk being given
 - how the milk is being given (spoon, cup, bottle, etc.)
 - frequency of supplementation
 - volume being given.

Current problem

- What is/are the current problem/s?
- When did the problem/s start?
- If pain is present:
 - onset of pain
 - when the pain occurs
 - location of pain
 - duration of pain
 - level of pain
 - description of pain – burning, tender, sensitive, itchy, sharp, stabbing
 - anything which makes pain better or worse.
- Has the woman seen other health professionals? If so, who? (e.g. lactation consultant, paediatrician, GP, Maternal and Child Health Nurse)
- What advice has already been given and from whom?
- Has any of this helped the problem and if so, what?

4.1.2 Examination

Examination of the woman

- General health
- Breast shape, size and symmetry
- Breast fullness, engorgement and/or areolar oedema
- Nipple shape, colour and size, presence of trauma, discharge.

Examination of the infant

- Overall assessment of physical appearance, skin colour, muscle tone, skin turgor and nutritional status
- Posture, symmetry, skull shape
- Mouth:
 - tongue shape and movement
 - palate
- Suck strength and organisation.

Assessment of a feed

- Positioning and attachment technique
- Sucking patterns
- Signs of milk transfer
- Appearance of the nipple immediately after a feed; a compressed nipple usually indicates poor attachment
- Softening of breasts evident after a feed
- Infant behaviour during and after the feed
- If expressing with pump, assess for correct use of breast pump.

4.2 Nipple issues

4.2.1 Nipple variations

Despite wide variation in nipple size and shape, most women's nipples are perfectly adequate for breastfeeding. Variations which may present initial challenges with breastfeeding include inverted, retracted, flat, dimpled, fibrous, very small, very large or elongated nipples.

Other variations which may cause challenges include:

- Previous nipple surgery or trauma
- Abnormalities of nipple ducts and pores
- Nipple piercing.

Management of nipple variations

Prenatal counselling should focus on building the woman's confidence that breastfeeding is possible but may require additional support in the early days. Some women may benefit from a visit to a lactation consultant during pregnancy to discuss postnatal management strategies.

Postnatal management

- Facilitate immediate and prolonged skin-to-skin contact after birth and offer breastfeeds when the infant exhibits feeding cues. Continue skin-to-skin contact during the postnatal period.
- Facilitate infant-led feeding and offer breastfeeds when the infant is in the quiet, alert state.
- Ensure correct positioning and attachment techniques.
- The mother may manually stimulate and gently draw out a flat, retracted or inverted nipple immediately before attaching the infant. This may also be done using a breast pump on very gentle suction.
- If the infant is unable to attach, express colostrum and feed to the infant via dropper, cup, spoon or syringe. Bottles and teats should be avoided if the infant is having difficulty attaching to the breast.
- Until the infant is able to attach correctly to the breast, lactation will need to be established through expression of breastmilk.
- Prevent or manage breast fullness.
- Once the milk is in, if the infant is still unable to attach to the breast, consider the use of a nipple shield and arrange for ongoing care by a lactation consultant or experienced clinician [49, 86].

Nipple piercing

There is limited evidence regarding the effects of nipple piercing on lactation. Complete removal of nipple jewellery is generally recommended in order to avoid potential infant choking if jewellery is dislodged. Although milk supply is generally unaffected, cases in which milk supply was reduced in the affected breast have been reported [87]. Scar tissue may also lead to blocked ducts or mastitis [88].

4.2.2 Nipple pain and trauma

Many new mothers experience transient nipple pain or discomfort in the first few days after birth. However, pain that is severe, persistent, or occurs between feeds should be investigated. Nipple pain is the most common reason for early cessation of breastfeeding [85].

Nipple appearance

Painful nipples may appear normal, or associated nipple trauma may be apparent. Nipple trauma ranges from mild inflammation, small blisters and grazes through to compression stripes, cracks and fissures. Other indications of nipple pathology include:

- Exudate or yellow crust
- Plaques or flaky skin
- Shiny skin
- Pustules
- Blanching.

Causes

There are many possible causes [31, 85]:

- Poor positioning and attachment (the most common)
- Engorgement
- Nipple variations such as flatness, retraction, inversion
- Candida infection
- Eczema/dermatitis
- Bacterial infection
- Herpes simplex
- Nipple vasospasm
- White spot (blocked nipple pore)
- Inappropriate use of breast pump:
 - breast pump shield too small or incorrectly placed
 - suction too high
- An infant with very strong sucking vacuum.
- Anatomical variations in the infant such as:
 - a high arched, flattened or bubble palate
 - disorganised sucking action
 - tongue-tie (ankyloglossia)
 - biting
- Hormonal sensitivity; for example, during ovulation, menstruation or a new pregnancy.

Routine nipple care and prevention

Prevention of nipple damage centres on good management and assessment of breastfeeding from birth. Routine nipple care includes:

- Avoiding the use of soaps, shampoos and non-medically prescribed ointments
- Avoiding synthetic bras – cotton is preferred
- Avoiding plastic-backed breast pads
- Changing breast pads frequently
- If the mother needs to remove the infant from the breast before the infant has finished feeding, she should first break the suction by inserting a clean finger gently into the infant's mouth
- Topical use of expressed breastmilk or highly purified lanolin is commonly prescribed for routine nipple care although evidence to support the use of either is limited [31, 89].

Management

Management involves identification of the cause and initiation of appropriate treatment. A full breastfeeding assessment should be conducted as per the section on 'Routine breastfeeding assessment'.

General management [31, 85, 86]

- Offer the least sore nipple first
- Soften the areola if engorged prior to attachment
- Stimulate let-down before attaching the infant to the breast
- Correct positioning and attachment; try different positions
- Try infant-led attachment; that is, placing infant skin-to-skin in upright position on the mother's chest and allow to seek the breast and attach spontaneously
- Treat any associated engorgement
- Apply warm compresses for 5 minutes after feeds, or hydrogel dressings, to relieve pain
- Use moist wound healing principles; for example, apply expressed breastmilk or purified lanolin after feeds
- Take care with hydrogel dressings if nipples are damaged as the risk of infection may be increased
- Re-assure and support the mother – this is vital
- Review the woman for possible causes of ongoing pain, if the pain is not resolving.

If the nipples are too sore to feed [28, 31, 86]

- The woman may need to 'rest and express' the affected nipple/breast until pain subsides. This may be for a few feeds or a few days; may be from one or both breasts.
- If using a breast pump, ensure the breast pump shield is placed centrally over the nipple, is of sufficient diameter, and that suction pressures are comfortable for the woman.
- Express enough to drain the breast well to prevent engorgement or mastitis.
- Feed the infant the expressed breastmilk by dropper, spoon or cup. Avoid use of bottles and teats if possible, particularly in a very young infant and if the cause of nipple trauma is poor attachment.

Use of nipple shields for nipple pain and trauma

There is limited evidence to support the use of nipple shields for management of nipple pain and trauma without first correcting the cause. The indiscriminate use of shields may exacerbate the problem and cause early weaning from the breast. In some cases, with the guidance of a knowledgeable clinician, judicious use of a nipple shield may protect sore nipples during healing and enable the mother to continue to breastfeed. If the nipples are so painful that the mother cannot breastfeed, the clinician should discuss the choice to 'rest and express' or use a nipple shield with the woman [31, 85, 86, 90].

4.2.3 Other nipple problems

Bacterial infection of the nipple [85]

Cracks and fissures in the nipple may be colonised with pathogenic bacteria, most frequently with *Staphylococcus aureus*. This presents as nipple inflammation, weeping, crusting lesions or pustules, and may result in delayed wound healing and an increased risk of mastitis.

Treatment

- Apply topical mupirocin after feeds
- Prescribe oral antibiotics if risk of mastitis is high.

Nipple vasospasm

Vasospasm of the nipple is often unrecognised as a cause of nipple pain. It may be associated with a history of nipple trauma due to poor attachment or nipple infection. Vasospasm may be exacerbated by cold temperatures or nicotine and caffeine due to their vasoconstrictive properties. The clinician may need to ask a woman with pain to observe the timing of pain, and appearance of her nipples during pain, to identify any associated colour changes, in order to make the diagnosis.

Signs and symptoms

- Nipple pain immediately after or between feeds, or pain precipitated by cold, such as when getting out of the shower.
- Pain may range from mild to intense and last for a few minutes or longer.
- Pain may radiate into breast.
- May be associated with triphasic colour changes of the nipple – from white, to blue, to red.

Management [31, 85, 86]

- Avoid exposure to cold; wear warm clothing and breastfeed in a warm environment.
- Avoid airing the nipples after feeds.
- Use warm packs and nipple warmers after and in-between breastfeeds.
- Avoid caffeine and nicotine.
- Magnesium supplements may assist in vasodilation (300 to 600 mg magnesium daily recommended).
- Consider nifedipine if pain does not resolve with above measures, or in women with primary vasospasm. Nifedipine is a calcium channel blocker which induces vasodilation, and may be prescribed commencing with one 20 mg Slow Release (SR) capsule daily, and gradually increasing, up to 60 mg SR daily. Nifedipine is compatible with breastfeeding.

Herpes simplex virus

Herpes simplex is highly contagious and infection in the neonate can be life-threatening. In the neonatal period, the presence of herpes lesions on the breast is a contraindication for breastfeeding until the lesions have completely resolved. In older children, the infection may originate from herpes stomatitis in the child, and therefore the child is already infected [91].

Signs and symptoms

Discrete lesions may occur on the areola or breast and are usually extremely painful.

Management

- In the neonatal period avoid direct contact between the infant and the lesions; the woman should not breastfeed or offer skin-to-skin contact.

- The affected breast must be regularly drained through expressing to maintain the milk supply.
- Expressed breastmilk from the affected breast must NOT be fed to the infant and should be discarded.
- The infant may be fed from the unaffected breast.
- The woman may be prescribed acyclovir; this is considered compatible with lactation.
- Educate the mother about the importance of hand-washing.

Eczema and dermatitis

Eczema is the term that includes several types of dermatitis: atopic, irritant or allergic contact dermatitis [92]. Atopic women may have a history of flexural eczema, and may be prone to develop irritant contact dermatitis when using topical agents. Irritant contact dermatitis may also be caused by washing detergents, soaps, lotions, fabrics, breast pumps, and food particles from the infant's mouth.

Signs and symptoms

- Itching is a prominent symptom; may also be described as burning.
- A well-demarcated, inflamed rash is visible, generally on the areola.
- Skin may be dry and flaky, or a weepy exudate with crusting may be seen.
- It is usually bilateral.
- Rash may extend beyond the edge of the areola.

Management [31, 85, 93]

- Breastfeeding can continue.
- Stop using soaps and creams unless medically prescribed.
- Breastfeed before giving solid food to the infant or rinse the infant's mouth with water before feeds.
- A strong topical corticosteroid ointment, such as Mometasone furoate ointment or Methylprednisolone aceponate ointment once daily can be safely prescribed for up to ten days; the woman should be instructed to apply the ointment thinly after feeds (no need to wash off).
- If crusting is present, a topical antibiotic, such as mupirocin ointment (three times a day), may be required to treat the bacterial infection.

Other nipple conditions

Clinicians should be aware that less common conditions may also occur on the nipple. For these, specific treatment should be sought:

- White spot/nipple bleb [See section on Blocked ducts.]
- Psoriasis
- Paget's disease (a type of breast cancer that appears as an eczematous rash)
- Herpes zoster (shingles).

4.2.4 Nipple shields

Nipple shields have been associated with a decrease in milk transfer in the past [94]; however, thin silicone shields used currently appear less likely to affect milk intake [95], although more studies are required to confirm this [96]. Inappropriate use may aggravate the original problem, particularly in the case of nipple trauma and especially if the nipple becomes pinched inside the shield. The benefits of nipple shields may outweigh the possible disadvantages, particularly if they are used with the guidance of clinicians skilled in their use and good follow-up care is available [97].

Indications for use

Nipples shields should only be introduced after a thorough assessment of breastfeeding has occurred and other management strategies have been unsuccessful. Common indications include [97]:

- Nipple variations where the infant is unable to attach to the breast
- Transitioning infant from artificial teats to the breast
- Preterm infant with difficulty maintaining attachment
- Infant with micrognathia (e.g. Pierre Robin syndrome)
- Infant with low tone (e.g. Down syndrome)
- Disorganised sucking resulting from birth trauma, neurological conditions, upper airway abnormalities
- Oral cavity abnormalities(e.g. cleft palate, high or bubble palate)
- Use of a nipple shield for sore and damaged nipples is not a first-line treatment. However, if other strategies have not resolved the problem, judicious use may enable the mother who may otherwise stop breastfeeding to continue.

Key points

- Use only thin, silicone nipple shields.
- Use only after the milk is 'in' and flowing.
- Choose the correct size; the nipple should not be squashed into the shield. Most women will need a medium to large shield. Use the largest shield possible for the infant's mouth as the infant will then be able to take more of the breast tissue into the shield, thus increasing milk transfer.
- Monitor infant weight gain.
- Advise the mother that use is temporary in most circumstances, and that with time and support, most babies learn to breastfeed without a shield.
- Refer mother to a lactation consultant or other clinician skilled in their use for ongoing support and management.

Instructions for use

- Express a few drops of milk to start the milk flowing.
- Smear breastmilk onto the outside of the shield to encourage the infant to attach.
- Hand express a few drops of milk into the shield before offering the breast to the infant.
- To draw the nipple into the shield, first turn the shield almost inside out and fold the wings outwards. Then place the centre of the shield over the nipple and fold the wings back into place and hold the shield with fingers at the outer edges.
- Touch infant's lips with nipple shield, wait for a wide-open mouth then bring the infant quickly onto the shield.
- Ensure a deep latch with the lips around the widest part of the shield, close to the breast. It is important that the infant does not slip back off the shield as this will cause pinching and nipple damage.
- Feed duration may be longer due to possible reduced milk flow. Observe for signs of milk transfer and monitor infant's output, weight and wellbeing.
- Breast compression may be necessary to facilitate breast drainage and milk transfer.
- If breasts do not feel well drained after feeds, some expressing may be required after feeds to prevent engorgement. Advise mother to observe for signs of blocked ducts or mastitis.

Cleaning instructions

Rinse in cold water after use, then wash in hot soapy water and rinse under hot running water. Drain, dry and store in a clean covered container.

Weaning from the nipple shield

- Continue to offer breastfeeds without the shield, drawing the nipple out manually or with a pump as above.
- If unable to attach, start the feed with the shield then take the shield off during a break in the feed and try again.
- The time taken to wean from a shield varies considerably. Ideally, the infant will be directly breastfeeding within a few weeks; however, some women with severe nipple inversion may need to use a shield for many months.
- Seek assistance from a lactation consultant or experienced clinician for ongoing support.

4.2.5 Blood in the breastmilk

Around 15% of lactating women have blood in their early breastmilk when cytologically examined [30]. Increased vascularisation of the breast and rapid cellular proliferation during pregnancy may cause a pinkish or rust-tinged appearance to colostrum and early milk, commonly known as ‘rusty pipe syndrome’. This usually goes unnoticed unless the mother is expressing or her infant vomits blood [30].

Other causes of blood in breastmilk include:

- Nipple or breast trauma
- Intraductal papilloma – a small, benign growth on the lining of a duct which may erode, causing painless bleeding into the duct
- Fibrocystic disease.

Management [30, 31, 49]

- Small amounts of ingested blood will be tolerated by most infants and therefore breastfeeding can usually continue.
- Ensure correct positioning and attachment and manage nipple trauma.
- If blood in the breastmilk continues for longer than a few days, diagnostic ultrasound and cytologic evaluation should be considered.
- Moderate vomiting of blood in an infant requires medical review to exclude illness.

Blood-borne viruses and blood in breastmilk

Hepatitis C

- There is no evidence that breastfeeding increases the risk of transmission of hepatitis C from mother to infant.
- However, due to a theoretical risk of transmission when there is blood in the breastmilk, women should be advised to express and discard breastmilk if it may be contaminated with blood, such as by cracked, abraded or bleeding nipples [98].

Hepatitis B

- There is no evidence that breastfeeding increases the risk of transmission of hepatitis B from mother to infant.
- Blood in breastmilk is not a contraindication to breastfeeding if the infant of a HBsAg (hepatitis B surface antigen) positive mother receives active and passive immunisation within 12 hours after birth [98].
- It is recommended that the baby should be given hepatitis B vaccine within the first 24 hours after birth or as soon as possible thereafter. [39]

4.3 Breast issues

4.3.1 Full breasts and engorgement

Full breasts

The breasts may become very full when secretory activation (lactogenesis II) occurs after birth. This physiological event usually resolves rapidly with regular, effective suckling and removal of milk by the infant [99].

Prevention

- Early initiation of breastfeeding (or expressing if mother and infant are separated) followed by frequent, effective and unrestricted breastfeeding or by expressing 8–10 times in 24 hours.
- Correct positioning and attachment.
- Avoid the use of pacifiers, artificial teats and supplementary feeds.

Management [30, 99, 100]

- Continue to offer frequent and unrestricted breastfeeds.
- Apply warmth before feeds to assist milk flow.
- Soften the areola before feeds by expressing a small amount of milk or apply reverse pressure softening [101].
- Allow the infant to finish the first breast before offering the second. If the infant only feeds from one side and the second side is uncomfortably full, express a small amount until the breast feels comfortable.
- Alternate feeding positions to facilitate drainage of all breast segments.
- Allow milk to drip from one side while feeding from the other.
- Express after feeds if the breast still feels full until it feels comfortable. When expressing, avoid complete emptying of both breasts at each feed as this may increase breast fullness. Some women will do a one-off complete expressing of their breasts to break the engorgement cycle and help facilitate the baby being able to effectively attach for the next feed.
- Apply cold packs after feeds; this may reduce swelling [102].
- Gently massage the breasts whilst under the shower, allowing milk to flow out spontaneously.
- Recommend analgesia such as paracetamol or ibuprofen.
- Maintain good drainage and comfort until breast fullness resolves, usually within a few days.
- Teach mother how to check for lumps and follow guidelines for blocked ducts if required.
- Teach mother how to recognise signs of mastitis and seek professional advice if necessary.

Engorgement

Full breasts may develop into engorgement, where the breasts are swollen and distended with both milk and tissue fluid [100]. ‘Venous and lymphatic drainage are obstructed, milk flow is hindered, and the pressure in the milk ducts and alveoli rises’ [99 p. 13]. Unresolved engorgement may lead to a reduced breastmilk supply due to the autocrine control (local feedback) mechanism which regulates milk production.

Causes

- Delayed or infrequent feeding
- Ineffective milk removal [86].

The difference between full breasts and engorgement can be seen in Table 11. [86, 99]:

Table 11: Full breasts and engorgement

Full breasts		Engorgement
Breasts	Warm, heavy, tender	Hot, oedematous, painful
Skin	Normal appearance, possible marbling	Shiny, streaky or diffuse red areas
Areola	Firm	May be stretched flat and oedematous
Milk flow	Milk flows well, infant can still suckle and remove milk easily	Poor or no milk flow, difficult for the infant to suckle
Fever	Usually absent	May have a mild fever

Prevention and management

- Follow guidelines for prevention and management of full breasts
- If engorgement is not resolving with the above measures, completely draining both breasts once using an electric breast pump is a common practice that appears to break the cycle of engorgement. This may be repeated after 24 hours if engorgement is not resolving.

4.3.2 Blocked milk ducts

A blocked milk duct may cause milk to build up behind the blockage, causing inflammation of the surrounding tissues. Some women may experience recurrent blocked milk ducts.

Predisposing factors [30]

- The exact cause may be unknown.
- Women who have a large milk supply can be prone to blocked ducts.
- Sub-optimal management of full breasts and engorgement.
- Long intervals between feeds or missing feeds.
- External pressure on the breasts; for example, from a tight bra, holding the breast too firmly with the fingers or hands during feeds or consistently lying on one side in bed.

Signs and symptoms

- Tender, palpable breast lump
- The skin may appear reddened and may be warm to touch.

Prevention

- As per prevention and management of full breasts and engorgement.

Management [30, 86, 99]

In addition to management of full breasts and engorgement:

- Feed on the affected side first
- *Gently* massage over the affected area towards the nipple as the infant breastfeeds or when expressing; massage may also be done under the shower
- Position the infant's chin towards the blockage if possible to assist drainage of the area
- Avoid restrictive clothing and pressure on the breasts
- Teach mother how to recognise signs of mastitis and seek professional advice if necessary
- Commence an anti-inflammatory such as ibuprofen if the blockage persists
- If the blockage does not clear within 12 hours, seek medical advice.

4.3.3 White spot/nipple bleb

A blockage at the nipple pore may appear as a white spot on the nipple surface. Milk may leak under the epidermis causing an opaque, raised white bleb, which is often associated with painful nipples during feeding. The cause is not known, and some women experience recurrent white spots.

Management

- Softening the nipple skin with a wet, warm compress immediately prior to a breastfeed has been anecdotally reported to be helpful in removing the white spot. This may need to be repeated a number of times until the blockage resolves.
- The white spot may soften with the use of olive oil.
- Removing the white spot with a sterile needle may be required. The woman should be referred to a medical practitioner or lactation consultant familiar with this procedure [30, 99].

4.3.4 Galactocele

A galactocele is a milk-retention cyst which presents as a smooth, rounded swelling in the breast. Initially, it is filled with milk which later becomes a thick, creamy or cheesy material. Diagnosis is by ultrasound or aspiration. The cyst can be aspirated but may fill up again after a few days. Surgical removal is possible under local anaesthetic without disrupting breastfeeding [31].

4.3.5 Mastitis

Mastitis is an inflammation of the breast tissue which may or may not be associated with a bacterial infection [99]. In infective mastitis, *Staphylococcus aureus* is the most common pathogen. Less commonly, the pathogen may be a *beta-haemolytic Streptococcus* (such as Group A or Group B streptococcus) or *Escherichia coli*. Community-acquired methicillin-resistant *S. aureus* (MRSA) is increasingly being identified as the causative pathogen [103], although rates of MRSA remain relatively low in most parts of Australia [104].

Risk factors [30, 105]

- Incomplete breast drainage due to:
 - poor positioning and attachment
 - missed feeds or long intervals between feeds
 - tongue-tie
 - restrictive clothing/external pressure on the breast
- Trauma to breasts or nipples

- Engorgement and/or chronic oversupply
- Unresolved blocked ducts or white spot on the nipple (blocked nipple pore)
- Rapid or abrupt weaning
- Stress, fatigue, overall poor health and nutrition
- Previous history of mastitis/breast abscess.

Management

Diagnosis [30, 106]

The diagnosis of mastitis should be based on clinical symptoms and signs of inflammation. The following signs and symptoms may develop rapidly.

Breast

- Red, swollen and painful area in the affected breast
- Skin may appear shiny and tight with red streaks.

General

- Flu-like symptoms: lethargy, headache, myalgia, nausea and anxiety
- Fever (temperature $> 38^{\circ}\text{C}$).

Investigations [105, 107, 108]

Routine investigations are not necessary. Investigations should be initiated if:

- Mastitis is severe
- There is inadequate response to first line antibiotics
- Hospital admission is required.

Investigations for severe mastitis, not responding to first-line antibiotics or requiring admission, should include:

- Breastmilk culture and sensitivity – hand-expressed midstream clean catch sample into sterile container (i.e. a small quantity of the initially expressed milk is discarded to avoid contamination with skin flora) [105]
- Full blood count (FBC)
- C-reactive protein (CRP).

Other investigations to consider

- Blood cultures should be considered if temperature $> 38.5^{\circ}\text{C}$
- Diagnostic ultrasound if an abscess is suspected.

Treatment

Treatment should begin immediately. Maintain breastfeeding; mastitis is not an indication for or an appropriate time to wean.

Non-pharmacological treatment

Effective drainage of breastmilk by breastfeeding and/or expressing is essential to maintain adequate milk supply and reduce the risk of breast abscess formation.

If presenting symptoms are mild and localised, the woman may consider enhancing breastmilk drainage:

- Physiological methods (e.g. expressing, massage and breastfeeding) to resolve the mastitis without the use of antibiotics
- Ensure correct positioning and attachment and frequent and effective milk removal
- Apply warmth to assist with let-down reflex and therefore milk flow and breast drainage
- Apply cold pack after feeds to reduce pain and oedema
- Avoid restrictive clothing/bra
- Refer to lactation consultant for appropriate feeding assessment and advice
- The woman will need rest, adequate fluids and good nutrition and practical domestic help if possible [30, 105].

Pharmacological treatment

Breastfeeding women are often reluctant to take medicines; women should be reassured that the medicines listed in this guideline are compatible with breastfeeding [107, 108].

Analgesia

Paracetamol is safe for breastfeeding mothers; maximum paracetamol dose is 4g per 24 hours. Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, may be effective in reducing symptoms relating to inflammation. Ibuprofen can be safely used while breastfeeding as only small amounts of ibuprofen are excreted into breastmilk.

Antibiotics [105]

If symptoms are not resolving within 12 to 24 hours with physiological methods, or if presenting symptoms are moderate or severe, antibiotic treatment may be required (in conjunction with non-pharmacological measures). Oral antibiotics should be continued for at least 5 days. Improvement should be seen within 2 to 3 days of antibiotic treatment. If improvement is slow, milk should be collected for culture and sensitivity.

Any infant whose mother is on antibiotic therapy should be monitored for systemic effects such as changes to the gastrointestinal flora (with symptoms such as diarrhoea, vomiting and thrush) or skin rashes.

Women who are very unwell and/or have signs of systemic sepsis may need to be admitted for intravenous (IV) antibiotics. IV antibiotics should be continued for at least 48 hours or until substantial clinical improvement is seen.

Table 12: Recommended antibiotic regimen [108, 109]

All listed antibiotics are compatible with breastfeeding

First choice			
Route	Drug	Side effects	Comments
Oral	Flucloxacillin (or dicloxacillin) 500mg 6-hourly for at least 5 days	Common – nausea, diarrhoea, rash Rare – anaphylactic shock, cholestatic jaundice	Monitor hepatic function if treatment continues for > 2 weeks, especially if there are other risk factors
IV	Flucloxacillin (or dicloxacillin) 2g 6-hourly		
If allergic to penicillin (exclude immediate hypersensitivity):			
Route	Drug	Side effects	Comments
Oral	Cephalexin 500mg 6-hourly for at least 5 days	Common – nausea, diarrhoea, rash Rare – anaphylactic shock	Cephalexin is usually prescribed for mastitis in women with a history of hypersensitivity to penicillin. About 3–6% of individuals with penicillin hypersensitivity have a cross-reaction to cephalosporins.
IV	Cephazolin 2g 8-hourly		
If there is a history of immediate penicillin hypersensitivity:			
Route	Drug	Side effects	Comments
Oral	Clindamycin 450mg 8-hourly for at least 5 days	Common – diarrhoea, nausea, vomiting Rare – anaphylaxis, blood dyscrasias, jaundice	Used as a second choice when individuals cannot tolerate usual therapy
IV	Lincomycin 600mg 8-hourly		
IV	Vancomycin 1.5g 12-hourly	Common – thrombophlebitis (IV) Rare – serious skin reactions	Only use if pathogen is resistant to first-line antibiotic therapy
If community-acquired methicillin-resistant <i>S. aureus</i> (MRSA) mastitis is suspected :			
Route	Drug	Side effects	Comments
Oral	Clindamycin 450mg 8-hourly for 5 days	Common – diarrhoea, nausea, vomiting Rare – anaphylaxis, blood dyscrasias, jaundice	Observe the breastfed infant for diarrhoea, thrush or allergic reaction
Oral	Trimethoprim+sulfamethoxazole 160+800 mg 12-hourly for 5 days	Common – nausea, vomiting, anorexia and allergic skin reactions	Use with extreme caution in breastfeeding mother with a preterm or critically sick infant and infants with G6PD deficiency

4.3.6 Breast abscess

Breast abscess is a collection of pus in the breast, which may occur as a complication of mastitis.

Risk factors

- Inadequately treated mastitis
- Abrupt weaning during an episode of acute mastitis.

Management [30, 105]

Diagnosis

In addition to the signs and symptoms of mastitis, there may be increased localised swelling, pain and tenderness at the site of the abscess. Women with an encapsulated abscess may present with no systemic symptoms but will present with a breast lump and usually describe a recent episode of mastitis. Clinical examination alone may not be sufficient to exclude or confirm an abscess. The diagnosis and location should be confirmed by diagnostic ultrasound.

Treatment

Women with a breast abscess need to be referred without delay to a breast surgeon. The preferred management is needle aspiration; however, surgical drainage is required in some cases. Ensure breastmilk and pus aspirate are collected for culture and sensitivity.

Continuation of breastfeeding or breastmilk expression is safe and recommended. The presence of a breast abscess is neither an indication for, nor an appropriate time, to wean.

Management of breastfeeding following aspiration/surgical drainage

- Management of breast abscess following aspiration/surgical drainage is as per management of mastitis.
- Positioning of the infant may need to be modified to avoid pressure on the aspiration/incision site or interference with drain tube if in-situ.
- If the infant is unable to feed directly from the affected breast, the breast should be kept well-drained by frequent and effective expressing until the mother is able to resume breastfeeding from that breast.
- Breastmilk leaking from the incision site is not uncommon and will not prevent healing.
- It can take a number of months for the breast to regain its softness following a breast abscess.

4.3.7 Breast and nipple thrush

Breast and nipple thrush is the over-growth of *Candida albicans*, in the nipples and in breast ducts. The diagnosis of breast or nipple thrush is usually made after consideration of the mother's symptoms; differential diagnoses should be considered (see below).

Signs and symptoms [110, 111]

Nipple/areola

- Mother may describe burning, stinging nipple pain that continues during and after the feed.
- The nipples are often very tender to touch and even light clothing can cause pain.
- Nipples may appear pink and/or shiny and areola may be reddened, dry or slightly flaky.

Breast

- Mother may describe shooting, stabbing, or deep aching breast pain. Pain may also be felt radiating into the back or down the arm. The breast pain typically occurs after feeding or expressing. The let-down reflex may be more painful than normal.
- The pain may be localised to one nipple or breast or may be bilateral.
- Breasts will appear normal. If inflamed, consider mastitis.

Infant

- The infant may have signs of thrush such as white oral plaques in the mouth (tongue and inside cheeks) or red papular rash with satellite lesions around the anus and genitals. Although these signs are not always present, it should be assumed that the infant is colonised with the organism if the mother has evidence of nipple thrush.

Once diagnosis of nipple and or breast thrush has been made both mother and infant should be treated at the same time to prevent re-infection.

Differential diagnoses

- Bacterial infection: if nipple damage is present.
- Nipple vasospasm: if nipple pain is exacerbated by cold and/or nipples blanch.
- Nipple eczema/dermatitis: if significant itching and/or rash are present.
- Trauma from infant tongue-tie or other nipple trauma.

Treatment

General

Treat any other site of fungal infection in the whole family (i.e. vagina, nappy rash, feet). Advise the woman to keep nipples dry by frequently changing breast pads, as thrush thrives in a moist and warm environment. Clean thoroughly any teats and dummies after use and boil for 5 minutes; replace weekly if possible. To prevent the spread of thrush, advise the woman to wash her hands thoroughly after nappy changes and before and after applying any creams/lotions.

Infant

- Infant's mouth: use miconazole oral gel 4 times a day for 1 week, then once daily for 1 week after signs/symptoms resolve.
- Use the spoon to measure a 1/4 teaspoon dose. The spoon should not be used for administering the gel. Using a clean finger, apply small amounts of gel at a time to the inside cheeks and over the tongue. See Royal Women's Hospital website for more information about use of miconazole oral gel.

Mother

Topical

- Nipple treatment for mother: miconazole oral gel/cream or nystatin cream applied to nipples after each feed (or 3–4 hourly during the day). The gel/cream should be applied thinly and does not need to be wiped off before the next breastfeed. Monitor for nipple irritation from miconazole gel (occurs in some women with sensitive skin; usually miconazole cream is tolerated).

Oral

- Fluconazole 150 mg capsules, one capsule every second day for 3 doses, followed by course of oral nystatin 2 tablets/capsules 3 times per day, preferably with food. Fluconazole is safe for breastfeeding women.
- If nipple/breast pain persists, consider a further course of fluconazole 150mg capsules, either one capsule every second day for 3 doses or one capsule daily up to 10 days (available only on private prescription), followed by a further course of

oral nystatin (2 tablets/capsules 3 times per day), preferably with food. A study of approximately 100 women prescribed fluconazole at the Royal Women's Hospital, Melbourne, found that women took an average of 7 fluconazole capsules (range was 1 to 29) [112].

If breast pain not resolving

If breast pain does not respond to fluconazole reconsider the diagnosis or consider oral ketoconazole, as the infection may be caused by non-albicans Candida, which may be resistant to fluconazole [113].

If nipple pain is not resolving

Consider gentian violet 0.5% aqueous paint applied after breastfeeding twice a day for up to 7 days (gentian paint is made up by pharmacy departments at RWH and Monash Medical Centre and compounding pharmacies) [111].

4.3.8 Breast surgery and breastfeeding

All surgical breast procedures have potential to affect breastfeeding [29]. It is important in the antenatal period to ask if the woman has had 'any' breast surgery, take a history of what is known about the surgery and discuss what may be the possible breastfeeding outcomes.

Antenatal assessment for a woman who has had breast surgery:

- Age at which surgery occurred
- Reason for the surgery
- Type of surgery (e.g. breast reduction, breast augmentation, nipple surgery, malignant or non-malignant breast lump removal)
- Breast development during puberty and pregnancy (particularly relevant for augmentation)
- Breastfeeding outcome if she has breastfed before.

Removal of breast lumps or cysts

Removal of lumps or cysts may or may not impact on breastfeeding, depending on the site of the incision and amount of breast tissue removed.

Nipple piercings

See section on nipple variations.

Breast augmentation (breast implants)

Augmentation is usually achieved with silicone or saline implants [114]. Periareolar incision for implants has been associated with insufficient lactation [29, 115]. Other difficulties relate to:

- Surgical complications – haematoma, infection, implant rupture
- Nerve injury – loss of nipple sensation (~10%); can interfere with milk ejection reflex
- Ductal injury – milk production will not continue in glandular tissue without intact drainage
- Implant may exert pressure on glandular tissue leading to pain/atrophy of glandular tissue/blocking ducts
- Need for re-operation; for example, for capsular contracture (8–41%; 20–26%) re-operation by 5 yrs
- Also possibility of insufficient glandular tissue prior to surgery [116].

If the augmentation was carried out due to unilateral or bilateral hypoplastic breasts, consider that there may not be adequate breast tissue for exclusive breastfeeding; close observation of the infant's intake and output should occur. Breastfeeding may be successful (particularly if incision is NOT periareolar) and women should be encouraged to breastfeed. The effects of augmentation on breastfeeding will be dependent on the reason for the surgery and the procedure used for the surgery.

Breast reduction surgery (breast reduction mammoplasty)

Breast reduction surgery will usually have a negative impact on breastmilk production and it is impossible to predict accurately how the surgery will impact on breastfeeding for each woman. Two breast reduction techniques are commonly used: the pedicle technique, where the nipple and areola remain on a stalk of breast tissue retaining much of the blood and nerve supply; or the free graft technique where the nipple is removed and replaced on the breast. The free nipple graft technique has often resulted in impaired or no lactation [29]. Women who have had breast reduction surgery may need to supplement their breastfeeding with other infant milk as full supply may not be achieved [117, 118]. The decision to supplement should be made after all attempts—such as extra expressing and using expressed breastmilk for the infant—to achieve full breastfeeding have been exhausted.

Lactogenesis II will occur as normal for the woman and her breasts will feel full, but careful observation of the milk transfer must occur as the milk ducts may have been severed with the surgery and little or no milk may be available for the infant. Observation of the infant's breastfeeds, output and weight loss/gain should be carefully monitored and supplementation should occur as required. Women may consider the use of the supplemental nursing system (SNS) to provide all the milk while still fully breastfeeding. Partial breastfeeding may still be considered a successful breastfeeding outcome for the woman who has had breast reduction surgery, so a 'wait and see' approach with close monitoring of mother and infant is recommended.

General advice when a woman has had any breast surgery:

- Obtain a history from the woman about her breast surgery – the type of surgery and reason for the surgery will usually define the breastfeeding outcome
- It is possible to breastfeed – most women can produce some amount of milk
- During establishment of lactation it will be important to monitor the infant for signs of adequate milk intake and growth
- Breast reduction surgery is the type of surgery most likely to negatively affect lactation capability.

4.4 Milk supply issues

4.4.1 Low milk supply

Low milk supply is one of the most common reasons given for premature weaning. It is therefore imperative the condition is diagnosed accurately, and, if confirmed, managed appropriately. Undersupply may be real, or perceived. Mothers may perceive their infant's need for frequent feeding and comfort as a problem with milk supply. Awareness of normal feeding patterns and growth and the developmental stages of infants can help mothers to be more reassured about their own infant's feeding behaviour [76, 119].

Causes [31, 86 Lawrence, 2011 #5251, 120]

Insufficient removal of milk from the breasts leading to a reduction in milk production is the most likely cause of low supply. This is associated with:

- Poor attachment
- Insufficient breastfeeding
- Restricting breastfeeds

- Sleepy infant
- Mother–infant separation
- Unresolved engorgement
- Use of artificial infant formula, teats and pacifiers
- Ankyloglossia (tongue-tie) and other oral cavity abnormalities.

Other reported causes of low milk supply may include:

- Maternal smoking, overuse of caffeine and other substance use
- Maternal alcohol consumption may slow the milk ejection reflex, thus reducing breast drainage and milk production
- Maternal medical problems; for example, retained products, severe postpartum haemorrhage, serious maternal illness, severe anaemia, maternal diabetes, obesity, maternal medications, hypothyroidism, polycystic ovary syndrome, Sheehan's syndrome, hormonal imbalance, inverted nipples [77]
- Menstruation and/or subsequent pregnancy – some women perceive a reduction in milk supply during menstruation or early pregnancy
- Use of combined oral contraceptive medications
- Excessive exercise [121]
- Infant medical problems interfering with breastfeeding; for example, congenital abnormalities, cardiac problems, prematurity, illness, oromotor dysfunction
- Early introduction of solids
- Insufficient glandular tissue. May be:
 - Primary; for example, hypoplastic breasts
 - Secondary; for example, surgery such as reduction mammoplasty.

Signs and symptoms

Low supply may be indicated by the following clinical signs. However, a careful history and examination is necessary, as the presence of some of these may not necessarily indicate low supply [77, 86]:

- Fewer than 3 wet nappies/24 hours by day 3
- Fewer than 5–6 heavy wet nappies/24 hours after day 5
- Concentrated urine
- No change to normal breastmilk stools by day 3–4 and scant stools thereafter
- Dry mucous membranes
- Weight loss greater than 10% birth weight
- Further weight loss after day 3–4
- Less than 20gm weight gain/day after day 3–4
- Failure to regain birth weight by 2 weeks of age
- Limited evidence of milk transfer during feeds
- Prolonged or continuous feeding with little evidence of satiety
- Persistent jaundice
- Persistently sleepy or lethargic infant
- Excessive crying, weak cry
- Infant appears unwell
- No signs of lactogenesis 2 on day 3–4 (breast fullness and heaviness)
- Breasts remain soft in between feeds (normal after around 3 weeks).

Management

Management involves identification of the cause and initiation of appropriate treatment.

General management

Once the cause has been identified, a plan of management should be prepared to ensure the infant remains hydrated and nourished whilst implementing strategies to increase mother's milk supply [31, 77, 86, 119]:

- Correct positioning and attachment; manage any nipple trauma
- Educate the mother regarding hunger and satiety cues and the signs of effective milk transfer
- Decrease non-medically prescribed or unnecessary use of artificial infant formula
- Increase the number of breastfeeds: wake the infant more often and/or offer the breast for comfort instead of using a pacifier
- Implement 'switch feeding' if infant is sleepy; change the infant from one breast to the other several times during a feed to keep the infant alert during the feed
- Increase skin-to-skin contact
- Breast compression during feeds may increase milk transfer
- Additional breast stimulation and drainage through regular expressing after or in between breastfeeds
- Good maternal nutrition, rest, relaxation and domestic support
- Reduce smoking, caffeine, use of alcohol and other substances.

Specific management

- Treat any underlying maternal or infant medical conditions identified.
- Consider referral to a lactation consultant for specialised lactation management, particularly if there are associated maternal or infant medical conditions.
- Refer to 'Infant-related breastfeeding issues' for management of low milk supply for mothers of preterm or unwell infants.

Supplementation of breastfeeds

- Expressed breastmilk is the first choice for supplementation of breastfeeds. Infant formula supplementation should only be initiated if insufficient breastmilk is available to meet the nutritional needs of the infant.
- Supplementation should ideally be given without the use of bottles and teats. Short-term alternative methods include spoon, dropper, or cup. A supplemental feeding system enables the infant to receive supplementation (EBM or formula) via a fine tube taped to the mother's breast, thereby increasing breast stimulation and drainage. Mothers can receive advice about the use of this system from a breastfeeding expert.
- The volume of supplementation should be enough to maintain hydration and nutrition, without decreasing the infant's interest in breastfeeding frequently; giving too much artificial formula may further decrease the milk supply.
- Frequent monitoring of the infant's output and growth as well as the mother's milk supply are essential measures in determining the appropriate amount of supplementation for each infant.

Pharmacological management

'Galactagogues are medications or other substances believed to assist initiation, maintenance, or augmentation of the rate of maternal milk synthesis' [119 p. 41]. Galactagogues should be used with caution and only after thorough evaluation by a lactation specialist and general management strategies have been implemented [119]. General management as outlined above should continue when galactagogues are prescribed.

Prescribing galactagogues

- The mother's medical history must be considered as medications or herbal products taken at medicinal levels may have adverse effects and may react with other maternal medications [119, 122].
- Domperidone is a peripheral dopamine antagonist that has been found to increase prolactin levels and stimulate milk production; it is widely used in mothers who are expressing long-term for preterm or unwell babies. It penetrates the blood-brain barrier poorly, reducing the risk of extrapyramidal side effects seen with the use of metoclopramide. Domperidone is considered compatible with breastfeeding but not all mothers will respond to its use as a galactagogue [77, 122, 123].
- Domperidone should be used with caution in women with severe cardiac disease or prolonged QT interval due to a reported risk of cardiac arrhythmias [122].
- The dose of domperidone as a galactagogue has not been definitively established. The current recommendation is 10 mg three times a day [124, 125].
- Once an adequate breastmilk supply is achieved, medication can be reduced slowly; for example, reducing over one week and then cease [124].
- The use of herbs, foods and tonics as galactagogues is common. There is no scientific evidence to support their use. Mothers should be encouraged to disclose the use of self-prescribed herbal compounds to determine possible drug interactions [122].
- Anecdotal evidence suggests that 2–3 capsules per day of fenugreek may increase milk supply; however, its use should be closely monitored especially if the mother is taking other medications [86, 122].
- Acupuncture treatment has also been described as effective in increasing milk supply [77, 120].

4.4.2 Breastmilk oversupply

In the early days of lactation, many women appear to have too much milk. As breastfeeding continues, local autocrine control begins to regulate milk production according to the infant's needs; this temporary breast fullness usually settles.

Management of full breasts and engorgement is outlined in section on full breasts and engorgement. Hyperlactation or a continuing overabundant supply after the first two to three weeks may present as follows [31, 77]:

Maternal signs

- Breasts never feel drained and may fill up quickly after feeds
- Breasts may feel firm, lumpy, uncomfortable, tender or painful
- Recurrent blocked ducts and/or mastitis
- Forceful let-down, which may be painful
- Leaking milk between feeds.

Infant signs

- Gulping, spluttering, choking, or coughing whilst breastfeeding
- Milk leaking around the mouth
- Infant may pull off the breast particularly when the let-down occurs
- The infant may be unsettled during the feed, arching back and pulling on and off the breast
- Excessive positing after feeds
- Mother may report that the infant seems very 'windy'
- Explosive, loose, green frothy stools
- Weight gains will vary from large weight gains through to inadequate weight gains due to too much 'fore-milk' and not enough calorie-rich 'hind-milk'.

Differential diagnosis

Rarely, galactorrhea may be associated with the following medical conditions [126]:

- Prolactinoma
- Hypothalamic-pituitary disorders
- Systemic disorders such as Cushing disease, thyroid disease
- Medications; for example, certain antihypertensives, antidepressants and antipsychotics.

Consider medical-related causes if management strategies for oversupply have been unsuccessful [77].

Management

Milk synthesis slows down when milk is left in the breast. Reducing the supply may take a few days to a few weeks. Reassure the mother that this is usually a temporary situation which can be managed [31, 77]:

- Feed from only one breast per feed. Offer the same breast again if the infant needs more milk within about an hour of finishing the feed.
- If the alternate breast is uncomfortably full, hand express a small amount for comfort. Offer the alternate breast at the next feed.
- Important note – once the overabundant supply has resolved, instruct the mother to re-commence offering both breasts per feed.
- If the infant cannot cope with a very forceful let-down, the mother can hand express to initiate the let-down and place the infant at the breast after this has subsided.
- The infant may need small breaks throughout the feed to cope with a rapid flow.
- Educate the mother regarding signs, symptoms and management of blocked ducts and mastitis.
- Symptomatic relief includes analgesia, anti-inflammatory medication, cold packs, supportive bra.
- Refer to lactation specialist for medical assessment if required.

4.4.3 Suppression of lactation

When a woman decides to suppress lactation, either by choice or necessity, she should be supported to do so safely to prevent the development of engorgement, mastitis or a breast abscess. The decision to suppress lactation may not be an easy one for the woman to make and women often experience a mixture of emotions including grief, relief and anxiety about future breastfeeding experiences. Stopping breastfeeding may not be a choice the woman wants to make; however, circumstances may have led her to decide this is the best path for her and her infant. Support and correct advice from health professionals are essential.

Suppression immediately after birth

The breasts start to produce milk within a few days of birth due to hormonal influences even if the mother does not commence breastfeeding. Without removal of breastmilk, further production will be inhibited during the first two weeks. If breastfeeding has not been initiated instruct the mother to [49]:

- Wear a firm but not tight bra or crop-top day and night until the breasts feel less full.
- If the breasts start to feel uncomfortably full, the mother should hand express a very small amount of milk for comfort. The mother will need instruction in hand expressing.
- Gently massage the breasts under the shower allowing some of the milk to leak. This may alleviate discomfort.
- Apply covered cold packs and/or recommend analgesia for pain relief.
- Wear breast pads if milk is leaking from the breasts.

Suppression if lactation has been established

- Suppression should take place gradually. Abrupt suppression is associated with development of mastitis and breast abscess.
- The frequency of breastfeeds can be gradually reduced over a period of a week to a month, depending on how long lactation has been established and the adequacy of the mother's milk supply.
- If the mother is expressing but not breastfeeding, the frequency and length of expressing episodes should be gradually reduced according to comfort and milk supply [49].

Suppression of lactation following stillbirth, fetal death in utero or neonatal death

- Parents who have experienced a stillbirth, fetal death in utero or neonatal death need the opportunity for open and sensitive discussions regarding options for lactation suppression. Parents should be advised that milk production may commence from 16 weeks' gestation onwards.
- Lactation can be seen as an affirmation of motherhood rather than something to be hidden. Some women find the gradual cessation of lactation to be an important aspect of their grieving process. Following the death of their baby some mothers have also found the option of donating their breastmilk to a milk bank to be a positive experience.
- Guidelines for suppression immediately following birth are appropriate if the infant has been stillborn.
- If the infant has died after lactation has been established, gradual suppression is recommended through expressing.

Medication suppression of lactation

- Suppression of lactation using medication is not routinely advised. Use of bromocriptine is no longer recommended due to serious side-effects [127].
- Occasionally, cabergoline may be prescribed for 'emergency' suppression or if requested by a mother who has experienced stillbirth.
- Cabergoline is most effective if given as a single dose within 24 hours after birth. Side-effects include dizziness, headache, nausea and hypotension.
- Dosage of cabergoline [122, 128]:
 - 1mg as single dose on the first day postpartum
 - 0.25mg every 12 hours for two days (total of 1mg) for established lactation.

4.4.4 Relactation/induced lactation

Relactation is where a woman who has ceased breastfeeding (or expressing) recommences lactation. Relactation may be attempted days, weeks or months after breastfeeding has ceased. It is usually easier to relactate if the period between the cessation and the recommencement of breastfeeding is short and the infant is younger. Milk production should be stimulated by expressing 3–4 hourly, whether milk is obtained or not. Regular breastfeeds should be offered to the baby. Breastfeeding supplementers might be used to help facilitate the infant feeding at the breast. 'Breastfeeding supplementers are designed to provide the infant with a steady flow of supplemental feed while he or she suckles and stimulates the breast and nipple' [129]. Medications such as domperidone may also be used to stimulate milk production.

Induced or adoptive lactation is also a possibility for some women including those who have not had a pregnancy [130, 131]. Protocols for inducing lactation have been developed [132, 133] and early referral to a lactation consultant for support and advice is advisable.

4.5 Maternal illness and breastfeeding

Maternal illness may have a direct effect on a woman's ability (both physically and emotionally) to care for her infant. Women may have pre-existing chronic conditions or acute conditions that occur during lactation. The majority of medical conditions and medications are compatible with breastfeeding. Clinicians should consider all risks—the risk of not breastfeeding the infant will rarely outweigh the risk of breastfeeding in women with a medical condition [134]. While adopting a multidisciplinary approach in caring for the woman and her infant, clinicians should be positive about the possibility of breastfeeding when discussing breastfeeding with women who have a medical condition.

It is beyond the scope of this document to advise about all possible conditions that women may have; however, the following is a discussion of common conditions that health professionals may need to consider. For further information about medication and lactation, see section on Medicines and breastfeeding.

Thyroid disease

Breastfeeding women who develop thyroid conditions can be treated and continue to breastfeed [135]. Undiagnosed hypothyroid disease may be a cause of low milk supply and should be investigated and treated [135].

Diabetes

Women with diabetes should be encouraged to breastfeed. Some women with Type 1 Diabetes describe a reduction in required insulin due to breastfeeding [136]. Continued routine maternal blood sugar monitoring is recommended.

Obesity and Polycystic Ovarian Syndrome (PCOS)

Women with a high Body Mass Index (BMI) are less likely to intend to breastfeed and have lower rates of breastfeeding than women with a BMI in the normal range [137]. The onset of lactogenesis may be delayed in obese women, although this may be due to associated medical problems and delays in initiation of breastfeeding [137]. Women with large breasts may have practical difficulties with positioning and attachment, and may require extra assistance. Breasts may need additional support (using, for example, a rolled towel) and alternative feeding positions such as an underarm hold may be necessary. Some women with polycystic ovarian disease report insufficient milk supply, which may be unresponsive to the usual measures to increase milk supply [136].

Acute illness and infections

Common colds, respiratory infections and gastroenteritis are usually self-limiting and do not require any interruption to breastfeeding. Breastfeeding provides antibody protection for the infant that may reduce the exposure and/or severity of the illness if acquired by the infant. Postpartum infections are often treated with antibiotics that are usually compatible with breastfeeding [138]; however, health professionals should check individual medications prescribed for compatibility with breastfeeding.

Epilepsy

Seizure disorders are usually well-controlled by medications; these medications are rarely a contraindication for the lactating woman. The advantages of breastfeeding outweigh the risks of the infant's exposure to the medication [139]. In the unlikely event of a seizure the breastfeeding mother is no more likely to drop her infant than if she was bottle-feeding. Usually an aura will alert the woman to an impending seizure and she can take measures to place the infant in a safe place.

Physically challenged mothers

Physical challenges—such as spinal cord injuries, limited limb function, visual or hearing impairment—may exist for pregnant and breastfeeding women. Most women with a disability are aware of their capabilities and have many strategies for adapting to life. The woman's knowledge of her health and capabilities and the health professional's knowledge of breastfeeding will normally facilitate excellent problem-solving to achieve breastfeeding. The support of family and partners will be crucial to success in most cases.

Depression

Untreated depression poses risks for both the woman and her infant; women should therefore be correctly diagnosed and treated. Treatment may include referral for counselling, psychotherapy, hospitalisation, out-patient treatment and pharmacological treatment.

Any medications prescribed will have some known and potential risks but these should be weighed against the benefits of breastfeeding for women with postnatal depression [140]. For some women, successful breastfeeding enhances bonding with their infant and increases their self-esteem [141]. More information about decision-making for women with depression and related disorders is available in beyondblue Clinical Practice Guidelines [140].

Asthma

Women with asthma should be encouraged to breastfeed. Breastfeeding should be encouraged and medications should continue while she is breastfeeding [135]. Many asthma medications are inhaled so medications are delivered directly to the lungs; the dosage is relatively small and infant exposure is minimal.

Maternal immunisations

'Standard vaccinations with killed or attenuated vaccines can usually be given to breastfeeding women without any problem. Breastfeeding does not adversely affect the immune response and is not a contraindication for vaccination' [135 p. 528]. The only vaccination that is contraindicated in breastfeeding women is smallpox [142].

Surgery and anaesthesia

If surgery is scheduled in advance, the woman can plan ahead with the hospital to facilitate the infant staying with her in hospital, have the family bring the infant to hospital to breastfeed, or to express and send milk home. Staff of non-maternity hospitals will often need the support and expertise of midwives or lactation consultants to support and facilitate the care of the breastfeeding woman. Women may need advice regarding expressing and storing breastmilk, pump use and maintaining milk supply. Where hospitalisation and surgery are unforeseen, referral to a lactation consultant if possible is advisable.

Following anaesthesia, mothers of healthy infants can generally resume breastfeeding as soon as they are awake, stable and alert [143]. Induction agents (e.g. propofol, thiopental) have extremely short plasma phases, and therefore transfer to milk is low to nil [143]. Likewise, anaesthetic gases are unlikely to transfer into milk. Most analgesics are compatible with breastfeeding; for example, morphine has limited transport into milk and poor oral availability for the infant [143].

4.6 Infant-related breastfeeding issues

4.6.1 Hypoglycaemia and the breastfeeding infant

Transient hypoglycaemia, as defined as a True Blood Glucose <2.6mmol/L, in the immediate newborn period is common. A physiological drop in blood glucose levels is self-limiting, with blood glucose levels rising spontaneously between 2–3 hours after birth whether the infant has fed or not. Healthy term infants who are breastfeeding on demand need no supplementation; routine blood glucose monitoring of all infants is not recommended [144, 145].

Blood glucose is essential for brain function and low blood glucose levels may be harmful to the infant. Therefore at-risk infants should be identified antenatally, have their blood glucose assessed after birth, and have any signs of hypoglycaemia recognised in the early postnatal period and treated according to hospital guidelines. Each hospital will have a clinical guideline for the care and management of infants at risk of hypoglycaemia that will include breastfeeding. It is important to continue to support the process of breastfeeding while an infant is being treated for hypoglycaemia.

General breastfeeding management for infants at risk of hypoglycaemia [144, 146]

- Skin-to-skin contact immediately after birth
- Initiate breastfeeding within 30–60 mins after birth
- Teach mother to recognise and respond to early infant feeding cues
- Follow organisational clinical practice guidelines regarding blood glucose measurements and ongoing management
- Encourage regular feeding (three hourly or 8–12 feeds in 24 hours) in the early postnatal period especially if the infant is not self-waking for feeds
- Observe and assess breastfeeds for breastmilk transfer
- If an infant is having difficulty with breastfeeding, breastmilk should be expressed and fed to the infant by cup, spoon or syringe if possible
- Reassure the woman that infant hypoglycaemia is temporary and that her breastmilk will be sufficient for her infant in the future
- Support the woman to establish a full milk supply by expressing, especially if the infant is not feeding effectively and additional supportive measures are being used to feed the infant.

4.6.2 The sleepy infant

Sleepiness is common in newborn infants. Some infants remain persistently sleepy for a few days or longer, do not wake spontaneously for feeds, or may have difficulty staying awake during feeds. The cause of persistent sleepiness in the full term healthy infant is often not known, but may occur in infants affected by labour analgesia or birth trauma. Prematurity, congenital abnormalities and jaundice are other common causes of persistent sleepiness. It is important to exclude possible medical reasons for persistent sleepiness and lethargy, such as hypoglycaemia, sepsis, congenital heart disease, neurological conditions, prematurity, jaundice, congenital abnormalities and failure to thrive [39, 86].

Management

- Conduct a routine breastfeeding assessment
- Ensure correct positioning and attachment technique
- Teach parents to recognise and respond to subtle feeding cues
- Wake the infant for breastfeeds, ensuring 8–12 feeds per 24 hours in the early postnatal period
- Implement strategies to rouse the sleepy infant or the infant who falls asleep easily at the breast – see below

- Monitor infant's progress
- If the infant's hydration or weight gain are of concern, breastfeeds may need to be supplemented with expressed breastmilk by cup, spoon, syringe or dropper until the infant is waking spontaneously and feeding more effectively at the breast [86].

Strategies to rouse a sleepy infant

- Unwrap infant, change the nappy and allow to self-stimulate for a few minutes
- Undress infant and place in skin-to-skin contact with mother
- Gently massage the infant's back, front, arms, legs and talk to the infant
- Give the infant a taste of expressed breastmilk either directly from the breast or from a spoon, cup or dropper
- Stroke the cheek and lips and encourage the infant to suck on a clean finger [39].

Strategies for the infant who falls asleep during breastfeeds

'Switch' feeding or 'double feeding' is a strategy that may be used to encourage a sleepy infant to stay awake during feeds. The infant is swapped to the other breast whenever he/she becomes sleepy and nutritive sucking is no longer occurring. Each time the infant swaps sides, the typically rapid sucking that occurs on attachment helps to stimulate the let-down reflex, which increases milk flow and encourages the infant to resume nutritive sucking.

To successfully implement this technique, ensure the mother is able to recognise the difference between nutritive and non-nutritive sucking. Some breast compression may aid let-down.

Switch feeding technique

- Utilise rousing techniques as above.
- Breastfeed on the first side until nutritive sucking and swallowing changes to non-nutritive sucking AND the infant does not respond to gentle stimulation (this may happen after only a few minutes).
- Gently remove the infant from the breast and use rousing techniques to wake the infant up again. Once awake, switch infant to the opposite breast.
- When the infant becomes sleepy on the second breast, remove from the breast again.
- Change the infant's nappy, and use gentle rousing techniques again.
- Offer the first breast again, and swap sides again when the infant becomes sleepy. Each breast may be offered two to three times per feed and breast compression while the baby is feeding may assist with milk flow.
- At the end of the feed, the infant may have a period of comfort, non-nutritive sucking.
- Once the persistent sleepiness is resolving and the infant is feeding more effectively, the mother can allow the baby to continue sucking to finish the first side first before swapping sides [86].

4.6.3 Breastfeeding and jaundice

Physiological jaundice

'Approximately 60% of term and 80% of preterm babies develop jaundice in the first week of life, and about 10% of breastfed babies are still jaundiced at 1 month of age. In most babies early jaundice is harmless' [147]. All infants have some elevation of unconjugated bilirubin relative to adult levels and this normal elevation is referred to as physiological jaundice [148]. Jaundice typically develops between day 2 and day 4 and clears by the end of the first week for term infants—slightly longer in preterm infants [39]. Early and frequent breastfeeding helps facilitate the passage of meconium and the clearance of bilirubin, thereby assisting to reduce jaundice. Poor breastfeeding and inadequate breastmilk intake during the early days of life may contribute to jaundice by increasing the reabsorption of bilirubin (enterohepatic circulation) [148].

Risk factors for jaundice [148]

- Preterm infants
- History of sibling treated for jaundice
- Rh sensitisation, ABO incompatibility, G6PD, haemolysis
- Bruising (cephalohaematoma), infection, delayed passage of meconium, poor feeding.
- More than 10% loss of birth weight.

Breastfeeding management of jaundice

- Identify the at-risk of jaundice infant, especially the late preterm or low birth weight infant who is at increased risk of breastfeeding difficulties.
- Early feeding, preferably in the first hour after birth.
- Education of mother to breastfeed when the infant displays early feeding cues.
- Frequent feeding 8–12 times in 24 hours (after the first 24 hours).
- Exclusive breastfeeding – unless treatment for poor intake being commenced.
- Observe breastfeeds and optimise the breastfeeding intake with correct positioning and attachment [148].
- If phototherapy is required – carefully assess milk intake and supplement with expressed breastmilk if needed.
- Breastfeeding should continue as usual during phototherapy treatment and should not require separation of mother and infant. Effective phototherapy can be carried out in the mother's room using fibre-optic devices or overhead phototherapy lights.
- Infant formula should only be used IF breastmilk intake is deemed inadequate after corrective breastfeeding and expressing measures have been undertaken and if weight loss is excessive. Infant formula should be kept to the minimum required so that frequent breastfeeding and expressing can be maintained.

Pathological jaundice such as jaundice occurring less than 24 hours after birth or jaundice needing multiple unit phototherapy should be identified early and referred to paediatric care for admission to a neonatal unit, investigation and treatment. 'Jaundice and some degree of hyperbilirubinemia are normal and expected aspects of newborn development' [148 p. 91]. All health professionals need to be able to understand and support breastfeeding during this expected physiological event.

Breastmilk jaundice

'Some healthy breastfed infants will have clinically apparent jaundice that persists beyond the first week of life or initially presents after the first week of life' [149 p. F462]. These infants will present with persistent visible jaundice and unconjugated hyperbilirubinemia but have normal weight gain, normal urine and bowel output and no other signs or symptoms of underlying conditions. Breastmilk jaundice is a benign condition that will resolve without treatment [149]. The mechanisms of breastmilk jaundice are not completely clear but some of the substances in breastmilk are involved. Importantly, breastfeeding should not be interrupted to diagnose breastmilk jaundice as this puts the infant at risk of not returning to or not maintaining exclusive breastfeeding [150]. It is important to ascertain if the infant has persistent jaundice due to 'not enough breastfeeding' or pathology such as sepsis or other conditions. Referral for paediatric assessment should be made to exclude underlying pathology. If breastmilk intake is inadequate then increased breastfeeding and/or expressing should be commenced. Additional lactation support may be required to rectify the breastfeeding problems.

4.6.4 The unsettled infant

An unsettled, crying and fussy infant is one of the main reasons that parents seek advice from health professionals, including doctors, maternal and child health nurses, and lactation consultants [151]. Parents are often concerned about milk supply or quality, gastro-oesophageal reflux and colic, and cease breastfeeding prematurely for these reasons [39]. It is therefore

important for parents to understand normal infant behaviour, including normal feeding and crying patterns, as well as learning techniques to help them to cope with an unsettled infant.

The early postnatal period

- Unsettled behavior can be normal or may be related to birth trauma, over-stimulation, environmental factors such as being too hot or too cold, being in an uncomfortable position.
- Before the milk comes in, infants typically feed very frequently, especially on the second day of life. Parents need reassurance that this is normal behaviour which assists in stimulating lactogenesis and helps to minimise breast engorgement.
- After the milk comes in, the infant may be unsettled for a few days as she/he adjusts to the larger volumes of milk.
- Crying is a late sign of hunger. Advise the mother to offer breastfeeds when her infant is in a quiet alert state to reduce hunger-related crying [152, 153].
- Teach parents how to recognise and respond to hunger cues.

Management

- Increase skin-to-skin contact and minimise over-stimulation.
- Ensure correct positioning and attachment and encourage baby-led feeding.
- Reassure the mother that it is okay to use the breast as a source of comfort for an unsettled baby.
- Expressed breastmilk may be given by spoon, cup or dropper after breastfeeds if the infant is still unsettled, until breastfeeding has improved.
- Avoid giving feeds of infant formula or water unless there are medical indications. The infant should be offered more frequent breastfeeds instead.
- Explore strategies to allow the mother to rest by enlisting help of family and friends.
- After the milk is in, if the breasts are overfull, encourage the mother to feed her infant on the first breast until he/she has finished and releases spontaneously before offering the second breast. An infant who is receiving large volumes of early milk may not settle for long and may experience abdominal discomfort [152, 153].

Excessive crying

Many infants have frequent, unsettled periods which may commonly occur in the evening. Some infants cry and fuss excessively. They may be irritable and have feeding difficulties, feeding very frequently or refusing the breast. Often, the cause of the unsettled behaviour is not known and parents may receive differing opinions and advice from family, friends and health professionals [39, 153].

Management

- Conduct a routine breastfeeding assessment and manage any breastfeeding issues identified.
- Assess infant growth and development.
- A medical assessment may be required to exclude conditions that may be causing excessive crying [154]. Features which warrant medical assessment include:
 - blood in stool or vomit
 - fever, vomiting, rash
 - ear discharge
 - offensive urine or stools
 - sub-optimal weight gain, or weight loss
 - dysmorphic appearance
 - developmental delay

- Reduce maternal intake of nicotine and caffeine
- Assessment of dietary allergens may be required [39, 152].

Strategies that may help

In the absence of medical or feeding-related causes of crying or unsettled behaviour, the following strategies may assist. Parents should be encouraged to experiment with a range of interventions to soothe an unsettled infant:

- Increase skin-to-skin contact and cuddling
- Carry the infant in an infant carrier or sling
- Try swaddling, rocking, singing, stroking, massage, bathing, music, white noise, movement in a pram or car
- Reduce sensory input – loud noises, television, bright lights, excessive movement or over-handling
- Ensure the infant is not too hot or too cold [152, 153].

Parental expectations

- Most parents feel anxious if their infant is unsettled. Health professionals can help by discussing normal infant behavior and helping parents to understand their infant's feeding, satiety and tired cues.
- Help parents to understand that babies do not always feed on schedule; that individual feeding and sleeping patterns vary and it is normal for babies to breastfeed around 8 to 12 times in 24 hours in the first weeks of life.
- Parents also need to be able to recognise nutritive sucking patterns and signs of milk transfer [152, 153].
- Parents may need additional support from their doctor, maternal and child health nurse or other health professionals.

4.6.5 Breast refusal and the non-attaching infant

Breast refusal can be distressing for both the woman and her infant. It can occur at any stage during lactation and can occur for various reasons. Sometimes the reason for the breast refusal is not apparent and may not be identified. The woman will need significant support during this event and be given strategies to feed her baby and maintain her milk supply.

Infants who refuse the breast may:

- Arch their back away from their mother
- Cry when approaching the breast
- Push away from the breast
- Turn head away from the breast [86].

Possible reasons for breast refusal [39, 155]

Infant-related:

- Problems with attachment or positioning at the breast
- Birth trauma such as fractured clavicle
- Tongue-tie
- Infectious illness such as respiratory illness, sore throat or blocked nose
- Ear infection
- Distraction while feeding
- Overtiredness/overstimulation
- Recent vaccination
- Teething, biting.

Mother-related:

- Nipple and breast variations
- Mastitis
- Changes to the smell of the woman – such as perfume, soaps, chlorine
- Unwell mother with decreased milk supply
- Maternal intake of particular foods/medicines
- Hormonal changes (such as ovulation, menstruation, oral contraceptive or pregnancy).

Milk supply reasons:

- Delayed let-down reflex
- Fast flow or slow flow
- Low milk supply.

Management

- Reassurance that this is usually a temporary situation
- Assess situation for reasons and correct if possible; for example, treat ear infection, increase milk supply, reduce distractions
- Be calm around the feeding process and do not force the infant at the breast
- Increase skin-to-skin contact to facilitate infant-led feeding and attachment
- Assess positioning and attachment technique
- Try feeding in different positions
- Try walking and breastfeeding or breastfeeding in the bath
- Express milk into the infant's mouth
- Try to feed the infant when they are drowsy
- Monitor infant's urine and stool output
- Maintain the milk supply with expressing
- Try breastfeeding with a nipple shield
- Feed the infant using a cup or bottle.

4.6.6 Breastfeeding multiples

Breastfeeding is the choice of feeding for all infants, whether born as a single infant or as twin or other multiple birth. Women and their families will need accurate advice from health professionals about how to breastfeed multiple infants [156]. Women can produce adequate breastmilk for twins and triplets and should be encouraged with the knowledge that demand almost always matches supply. Since it is more likely that women with a multiple pregnancy will give birth to preterm infants, supportive strategies for establishing breastfeeding in preterm infants will also be required.

During pregnancy it would be appropriate to refer the woman to a lactation consultant, if available, or a maternal and child health nurse who is experienced in supporting women with breastfeeding multiple infants. An antenatal referral will give the woman time to seek local community supports such as the Australian Breastfeeding Association and Australian Multiple Birth Association, access written information and involve her partner or other family members in antenatal classes so they will be able to best support her after the birth.

Establishing and maintaining breastfeeding

- Early breastfeeding after the birth.
- If separated from the infants due to infant/s being preterm or unwell then establish breastfeeding/expressing as soon as possible after birth. If expressing for twins, it is recommended to express 10–12 times in 24 hours [156].
- Women often start by breastfeeding multiple infants one at a time so they can focus on correct positioning and attachment. As the woman becomes more familiar with breastfeeding each baby she can then commence breastfeeding two infants at a time.
- Feeding infants simultaneously is more time-efficient for the woman; however, some women prefer to feed each infant one at a time. It remains the woman's choice.
- When a woman is breastfeeding triplets or quadruplets then a system of rotation applies for the infants; for example, two infants feed simultaneously (from one breast each) and the third infant is offered both breasts—‘triangular rotation’ [47 p. 52]. As with women with twins, women with higher order multiples will require great support from family and the community in all aspects of parenting, including feeding.

4.6.7 Preterm infants

Breastmilk is the choice of nutrition for preterm infants and not receiving breastmilk has been associated with risks for the preterm infant [5, 6]. Infants who are preterm or sick are usually transferred to a neonatal unit appropriate to the level of care required for the infant. Other well late preterm infants (late preterm defined as 34.0–36.6 weeks' gestation [157]) are sometimes cared for in the maternity ward setting with an increased level of medical and nursing/midwifery involvement. For both groups of infants the initial care will be assessment and stabilisation of the infant and for the mother, the establishment of her breastmilk supply.

Preterm infants being cared for in a neonatal setting

Care of the preterm infant is beyond the scope of this document. Preterm infants are physically, physiologically, metabolically and neurologically immature and all these characteristics impact on breastfeeding [158]. Clinicians who work with preterm infants would be well-advised to access specialist resources (e.g. WHO optimal feeding of low-birth-weight-infants technical review [159]) and lactation consultants to assist in establishing and maintaining the provision of breastmilk and breastfeeding for this specific population. Many preterm infants are able to display readiness to feed cues from as early as 28 weeks. Breast contact or breastfeeding should not be delayed until a gestational milestone is met; rather, it should be guided by the infant's signs of readiness. The preterm infant's ability to regulate swallowing with sucking and breathing will develop with increasing gestation. Some very preterm infants will commence breastfeeding on the ‘empty’ breast (known as non-nutritive sucking) so that milk flow will not compromise breathing.

Recently neonatal units have been increasing the amount of time that preterm and sick infants spend in skin-to skin contact with their parents, even up to 24 hours per day [160]. Skin-to-skin care has been positively associated with infant and women's outcomes such as better milk supply for the women, increased parental confidence levels and more stable heart and respiratory rate and temperature for the infants [41, 161].

Many maternity clinicians will be in contact with a woman establishing a breastmilk supply for her infant in a neonatal unit and the direct breastfeeding support of mother and infant will often be provided by neonatal nurses. Women who are separated from their infants are at risk of not establishing an adequate breastmilk supply. Ongoing separation and possible ineffective breastfeeding associated with being sick or preterm further puts the woman at risk of poor milk supply and her infant at risk of receiving infant formula. All health professionals should be aware of the evidence-based advice for the establishment of breastmilk supply. See Section on Expressing Breastmilk for guidance on expressing for preterm infants.

General care to promote breastfeeding in neonatal units

'Many of these interventions inter-relate: it is unlikely that specific clinical interventions will be effective if used alone [162]:

- Kangaroo skin-to-skin contact
- Peer support
- Simultaneous breastmilk pumping
- Multidisciplinary staff training
- The Baby Friendly accreditation of the associated maternity hospital have been shown to be effective
- Skilled support from trained staff in hospital has been shown to be potentially cost-effective'.

Late preterm babies being cared for in maternity settings

Late preterm infants (34 +0 to 36+6 weeks' gestation) comprise around 70% of all preterm infants. They are at increased risk of poor lactation outcomes, including early cessation of breastfeeding, jaundice, slow weight gain and dehydration. These infants are physiologically, metabolically, and neurologically immature; however, this immaturity may be subtle and often goes unrecognised by clinicians and parents [163-165].

Late preterm infants are at significantly increased risk of hospital re-admission in the first two weeks after discharge, particularly if they were cared for in a maternity setting rather than a neonatal setting, as is increasingly common. The main reasons for re-admission include jaundice, poor feeding and suspected sepsis [163-165].

Wight describes a cascade of poor feeding typical of the late preterm infant [166]:

- Weak and ineffective sucking at the breast
- Insufficient breast stimulation and breast emptying
- Insufficient milk production
- Dehydration
- Hypoglycaemia
- Hyperbilirubinaemia
- Excessive weight loss
- Increased risk of re-admission for the above reasons
- Mother/infant separation
- Supplementation with artificial formula
- Increased risk of early weaning.

Mothers of late preterm infants are at significantly increased risk of early lactation failure due to weak and ineffective sucking from the infant, poor breast drainage and subsequent suboptimal milk production [163-165].

Management

Management focuses on ensuring an adequate intake of breastmilk, establishing and maintaining the milk supply until the baby is able to feed effectively at the breast, and transitioning the infant to full breastfeeds [166].

Ensuring an adequate milk intake

- Conduct an early medical assessment to determine gestational age and to exclude co-morbidities.
- Assess and monitor physiological stability.
- Conduct a routine breastfeeding assessment within 24 hours and repeat at least daily.
- Keep mother and baby together unless there are medical indications for admission to a neonatal unit.

- Facilitate early, frequent and unrestricted skin-to-skin contact and breastfeeding. Ensure at least 8–10 breastfeeds per 24 hours in the early postnatal period. Ensure correct positioning and attachment.
- Avoid infant stress. Teach mothers how to recognise and respond to early feeding cues and advise to feed when the baby is in the quiet, alert state.
- Utilise strategies to rouse a sleepy infant.
- Written feeding plans and effective communication with parents and other clinicians are essential.
- Monitor infant's output and weight loss/gains and supplement breastfeeds with expressed breastmilk if required.

Establishing and maintaining an adequate milk supply

- If the infant is unable to breastfeed, the mother should initiate hand expression within six hours after birth and continue at least 8–10 times per 24 hours until feeding is established.
- If there is less than 10–15 minutes of effective feeding with evidence of milk transfer 8–12 times/24 hours, the mother may need to express to ensure effective stimulation and milk removal. Expressed breastmilk should be given to the infant to supplement breastfeeds in these circumstances.
- Continue regular expressing, and supplementation with expressed breastmilk will be required until the infant is able to feed effectively at the breast and an adequate milk production is established.

Transitioning to full breastfeeds

These infants are often discharged home before full breastfeeding is established. Prior to discharge home, the infant should:

- Be physiologically stable with no co-morbidities such as jaundice
- Be assessed as being correctly positioned and attached when breastfeeding
- Have an adequate intake exclusively or with supplements
- Have adequate output
- Have acceptable weight loss and/or gain.

Parents should be given a written feeding plan on discharge outlining frequency of feeds and any need for supplementation. A follow-up review should occur within 48 hours post-discharge and then regularly until the infant is at least two weeks of age or corrected gestation of 40 weeks [157]. Follow-up care should include regular assessment of infant wellbeing, breastfeeding progress and establishment of full lactation in the mother [157, 163-165].

4.6.8 Infants with conditions affecting breastfeeding

Infants may be born with specific conditions that affect breastfeeding, such as cleft lip and/or palate, Down syndrome, Pierre Robin Syndrome or congenital heart disease. Other short-term illnesses or conditions such as a respiratory infection or urinary tract infection may also affect the establishment or maintenance of breastfeeding. It is difficult to have a complete list of all conditions that may affect breastfeeding, but similar principles will apply for the provision of breastfeeding support when they may have an impact on breastfeeding. Many specific support agencies exist and parents should be referred to them. However, initial breastfeeding support will be provided by maternity care providers. Midwives, nurses and doctors should be aware of these common care principles to give the woman and her baby the best chance to establish breastfeeding.

Common breastfeeding care principles for all infants with conditions affecting feeding

- Encourage breastfeeding and the provision of breastmilk. The unique and protective effects of breastmilk and breastfeeding exist for all women and infants irrespective of medical conditions.
- Antenatal identification of potential challenges and counselling realistic expectations and information.

- Early referral to a breastfeeding specialist who will be able to support the woman and infant with their feeding needs.
- Early and frequent skin-to-skin contact, breast contact and breastfeeding if possible.
- Assess infant's ability to breastfeed.
- If infant is unable to feed at the breast, consider other methods of establishing and maintaining the milk supply.
- Clear communication between the health professionals giving breastfeeding advice.
- Close assessment of the infant's milk intake and urinary and bowel output, weight and growth.
- Modify breastfeeding positions and attachment to suit the mother and infant (e.g. Dancer hand position for infant with low muscle tone) [167].
- Assess how supplemental milk (if required) should be given to the infant (for example, bottle, cup, nasogastric tube, special needs feeder).

Tongue-tie

Tongue-tie (ankyloglossia) is a congenital condition in which the lingual frenulum is abnormally short and may therefore restrict mobility of the tongue tip [168]. The lingual frenulum is a normal structure that is present in all infants; if it is short and restricts the movement and function of the tongue it is called "tongue-tie". Not all tongue-ties require release (division of the frenulum) and may be considered a normal variant unless feeding problems are clearly identified [169, 170].

Tongue-tie can interfere with an infant's ability to suckle efficiently at the breast [171]. This may lead to nipple pain and trauma, poor breastmilk intake and a decrease in milk supply over time.

Indications that an infant could have a significant tongue-tie include [169]:

- Nipple pain and damage
- Misshapen nipple after breastfeeding
- A compression/stripe mark on the nipple after breastfeeding
- The infant often loses suction while feeding and sucks air
- The infant's mouth makes a clicking sound while feeding
- The infant fails to gain weight or has poor weight gains.

Signs of a symptomatic tongue-tie [169]:

- Tongue can't poke out past the lips
- Tongue can't be moved sideways
- Tongue tip may look flat or square, instead of pointy, when the tongue is extended
- Tongue tip may be notched or heart-shaped.

An experienced lactation consultant should conduct a thorough assessment of breastfeeding and infant tongue mobility to determine whether release is required. The Hazelbaker Assessment Tool for Lingual Frenulum Function may be used in conjunction with a breastfeeding history and infant assessment to objectively ascertain the need for tongue-tie release [172, 173]. If release is required, a referral should be made to an appropriate health professional able to release tongue-ties. These clinicians may include general practitioners, paediatricians, paediatric oral surgeons or lactation consultants trained in tongue-tie release [173].

Key messages

- Infants with tongue-tie may be at increased risk of breastfeeding difficulties.
- Early recognition and assessment of tongue-tie, and prompt referral to a lactation consultant is important.
- For infants with tongue-tie and confirmed breastfeeding difficulties, frenotomy often results in rapid improvement [170, 174].

Breastfeeding infants with cleft lip and/or palate

The infant with cleft lip and/or palate should be considered a normal infant with specific feeding difficulties. Some infants with this condition are diagnosed during pregnancy, which gives the maternity team opportunity to discuss expected feeding outcomes with parents, answer parents' questions and advise parents about resources they can access prior to the birth.

Understanding breastfeeding and clefts of the lip and/or palate

To be able to breastfeed effectively infants need to be able to attach to the breast, compress the breast and generate suction. The size of the cleft will usually impact on the degree of breastfeeding difficulty. With a cleft in the palate the infant is generally unable to generate a vacuum, thereby impeding breastfeeding. Infants with a cleft lip only are more likely to be able to breastfeed than an infant with a cleft palate or cleft lip and palate [175]. Some infants with small clefts of the soft palate will be able to generate some suction and some infants with clefts of the lip only are able to successfully breastfeed. Infants with clefts are prone to otitis media so mothers should be encouraged to provide breastmilk for the protective effects of breastmilk. The size and shape of the cleft/s and the size and shape of the mother's breasts should be considered during this assessment. In all cases the mother and infant will need to be assessed individually and a feeding plan implemented that addresses the wishes and experience of the mother and the infant's feeding needs.

Recommendations for care

- Early paediatric referral, particularly if not diagnosed antenatally.
- Encourage breastfeeding and provision of breastmilk.
- Direct breastfeeding may not be possible for some infants but a combination of breastfeeding, cup, spoon or bottle feeding expressed breastmilk (EBM) should be encouraged in preference to feeding infant formula [175].
- Advise the woman about maintaining an adequate milk supply if baby is not fully breastfeeding or is unable to attach for breastfeeding, including the use of an electric breast pump [176].
- Monitor the intake and weight of the infant and adjust the feeding plan accordingly.
- Mother will require long-term breastfeeding support and should be referred to appropriate services.
- Modification or breastfeeding positions may increase breastfeeding efficiency. Refer to the Academy of Breastfeeding Medicine Clinical Protocol #17: Guidelines for breastfeeding infant with cleft lip, cleft palate, or cleft lip and palate [175].

Breastfeeding infants with low muscle tone and/or poor sucking ability

Infants with low muscle tone may include those with Down syndrome or those with low muscle tone due to a birth incident or prematurity. The breastfeeding challenges may not be the same with every infant with low muscle tone so breastfeeding support and advice should be tailored to the ability of the infant and the mother's wishes. Low muscle tone may lead to ineffective feeding at the breast or bottle, so close observation of the infant's fluid intake is advisable. A nipple shield may be of assistance for infants with poor attachment to the breast and supplementation may be required with infant formula if full breastfeeding is not achievable. The woman may also need to express breastmilk to maintain an adequate milk supply and to obtain additional milk to supplement her infant. See section on expressing and storing breastmilk.

4.6.9 Slow weight gain

Monitoring the infant's progress and weight patterns in the newborn period is outlined in Section 3.7. This section will provide guidance on management of infants with slow weight gain beyond the first two weeks of life.

Management of the slow weight gaining breastfed infant can be problematic due to conflicting opinions about what constitutes normal growth [79, 177]. Growth patterns should always be assessed in conjunction with the full clinical picture of both mother and baby to determine if there is a problem or not [39].

The Victorian Child Health Record ‘My Health and Development Record’, 2011 contains the 2006 World Health Organization growth charts to monitor growth of infants up to 24 months of age. It is recommended that growth is consistently assessed using these charts.

Weight gains will vary significantly and are not always linear; however, Table 13 is a guide to expected parameters.

Table 13: Expected infant weight gain [39, 79, 178]

Age	Expected weight gain
0–3 months	30–40gms per day 150–200gms per week
3–6 months	100–150gms per week
6–12 months	70–90gms per week

Referral for slow weight gains

Table 14 (adapted from [177 p. 337]) provides a guide to the need for referral for further assessment and management of a slow gaining infant.

Table 14: Guide for management of infants with slow weight gains

Parameter	Normal: follow clinically	Possibility of concern: evaluate breastfeeding	Abnormal: evaluate medical condition and breastfeeding
Initial weight loss	7% or less	8–10%	10% or more
Return to birth weight	By 2 weeks of age	Later than 2 weeks of age	Later than 2–3 weeks of age
Average daily weight gain between 0–3 months (after return to birth weight)	30–40gm	20–30gm	Less than 20gm
Additional weight loss after immediate newborn period	None		Any amount of unexplained weight loss
Growth curve: weight	Weight may cross percentiles downward <i>after</i> 3 months of age	Weight crossing percentiles downward in the first 3 months	Completely flat at any age
Growth curve: length	Length continues on a given percentile	Decelerations of rate of growth in length	Completely flat at any age
Growth curve: head circumference	Head size continues on a given percentile	Acceleration or deceleration of rate of growth of head	Crossing of percentiles for several consecutive measurements

Adapted from [177 p. 337]

It is important to determine if slow weight gain is related to breastfeeding issues such as a low milk supply and/or dysfunctional sucking or associated maternal or infant factors such as illness, infection, peripartum factors, anatomical abnormalities, allergies, medications, environmental and genetic factors. Feeding problems are more likely than illness to be the cause of slow weight gain in the first month of life [177].

Assessment, monitoring and management principles of slow weight gain in infants

- Medical assessment and ongoing management of infant or maternal illness and/or causes with consideration for genetic factors
- More frequent weight and growth monitoring
- Assessment of breastfeeding and infant intake by a lactation consultant or skilled health professional and management of breastfeeding issues
- Dietician assessment and appropriate interventions for a breastfed infant on solids [179]
- Feeding plan for ‘catch-up’ growth or maintenance of current growth trajectory planned by a doctor and/or dietitian, with follow-up by Maternal and Child Health (MCH) nurse.

Slow weight gain and failure to thrive

“Failure to thrive is a symptom and not a diagnosis . . . the term ‘failure to thrive’ has been loosely used to describe all infants who show some degree of growth failure” [178 p. 343]. Consensus on the definition of failure to thrive is lacking, but in practice it is indicated by a weight decline on centile lines or weight falling below the lowest centile [179].

It is useful to make a distinction between a well, but slow gaining, breastfed infant and one who is failing to thrive while breastfeeding [178], as seen in Table 15. A well but slow gaining infant should continue to be closely monitored and assessed. The infant with failure to thrive requires medical referral as shown Table 15.

Table 15: Parameters for evaluation of breastfed infants [178]

Infant who is slow to gain weight	Infant with failure to thrive
Alert healthy appearance	Apathetic or crying
Good muscle tone	Poor tone
Good skin turgor	Poor turgor
At least six wet nappies/day	Few wet nappies
Pale, dilute urine	“Strong” urine
Stools frequent, seedy (or if infrequent, large and soft)	Stools infrequent, scanty
Eight or more feedings/day lasting 15–20 minutes	Fewer than eight feedings, often brief
Well-established let-down reflex	No signs of functioning let-down reflex
Weight gain consistent but slow	Weight erratic; may lose

5 Alternative methods of infant feeding when breastfeeding is not possible

5.1 Expressing breastmilk

Breastmilk expression is becoming increasingly common [180]. Most women will express breastmilk at some stage, primarily to enable someone else to feed the infant [181]. All breastfeeding women should be taught how to express breastmilk early in the postnatal period, and given instructions regarding safe storage of breastmilk as well as how to feed breastmilk to their infant [180]. However, when a mother is separated from her infant for any reason, continued milk production relies on regular and effective breastmilk expression.

Key points

- Breastmilk remains the optimum nutrition for infants even when separation or illness preclude direct breastfeeding.
- Lactation can usually continue throughout maternal illness if the mother wishes.
- There are very few absolute medical indications to wean from the breast.

Common reasons for expressing breastmilk

- Full breasts, blocked ducts, mastitis or breast abscess requiring regular and complete breast drainage
- Mother needs to increase supply
- Mother/infant separation due to illness in either
- Preterm or unwell infant unable to feed directly at the breast
- Mother undergoing surgery
- Rarely, some medications or radiological investigations may be contraindicated during lactation
- Mother is returning to paid work or study or has a social engagement.

Methods of breastmilk expression

Breastmilk can be expressed by hand or with the use of a breast pump or by a combination of both. Breast pumps may be:

- Manual
- Mini-electric or battery operated
- Hospital grade electric; single or double pump.

There is limited evidence related to the effectiveness of different methods of expressing or to determine the best technique of both hand and pump expression. Mothers may find they get different volumes of milk depending on which technique/pump is used.

General principles for all methods of expressing

- Ideally the mother should express in a comfortable, warm, private place free of distractions. Relaxation can assist milk flow.
- Many mothers find their let-down reflex and milk yields are better if they express whilst sitting beside their infant, or have a photo of their infant nearby.
- Wash hands with soap and warm water and dry hands.
- Have all equipment ready for use.
- Have a glass of water nearby.
- Begin by gently massaging the breast from the top down towards the nipple, including the underside of the breast. Repeat a couple of times. The nipples can be gently rolled between the fingers or stimulated to assist with initiation of the let-down reflex.
- If using a breast pump, select a suitable size breast pump shield to avoid compression or friction of the nipple.

Hand expression

Hand expression is simple and requires no equipment. Teaching should ideally be done with a cloth breast model in the early postnatal period and a ‘hands off’ approach. Hand expression can be used alone or combined with breast pump expression; it can be used to initiate a let-down prior to using the pump and may help to completely drain the breast at the end of an expressing episode.

Hand expression is usually recommended until the milk ‘comes in’. This is associated with improved breastfeeding rates at two months compared to women who commenced use of a breast pump shortly after birth [182]. Once the milk is in, use of a breast pump compared to hand expression is associated with increased volumes of expressed milk [183]. A breast pump is usually commenced as soon as there are a few millilitres flowing easily with hand expression.

Technique of hand expression

- Follow general principles for expressing as above.
- Place the thumb and forefinger widely apart on the edge of the areola, opposite one another.
- Gently press the thumb and finger back towards the chest wall into the breast tissue then gently squeeze the thumb and finger towards each other.
- Avoid sliding the fingers forward over the nipple and pinching or squeezing the nipple.
- Continue with a rhythmical compression as the milk starts to flow.
- It may take a few minutes until the let-down occurs, so the mother should be encouraged to keep trying.
- Drops of colostrum can be collected with a clean spoon, syringe or cup. Larger volumes can be collected into a clean, wide-mouthed container.
- The fingers can be rotated around the areola, and the hands can be alternated to avoid muscle fatigue.
- Continue until the flow eases then begin on the other side. The mother can alternate breasts a couple of times with each expression.
- Reassure that only a small amount of milk may be expressed at first while she is learning.
- There may be mild discomfort at first but hand expressing should not be painful.

Manual/hand breast pumps

Manual breast pumps are intended for intermittent use only; that is, once or twice a day two to three days per week. They are not suitable for frequent or full-time expressing. The manufacturer’s instructions regarding their use should be followed.

Technique for use of a manual pump

- Follow general principles for expressing as above.
- Begin with hand expression to start the flow of milk.
- Centre the nipple in the breast pump shield and place the rim of the shield flat against the breast. The shield should be held firmly to create a seal but avoid pressing in to the breast.
- Rapid movement of the piston or hand piece to begin may help to initiate the let-down reflex. Once milk is flowing, the piston should be operated in a smooth, rhythmic compress and release action, avoiding prolonged suction.
- Change to the other breast when milk flow slows significantly. The pump can be alternated from breast to breast as often as required to maintain milk flow.
- Store expressed milk as per storage guidelines (see below).

Electric breast pumps

Electric breast pumps range from compact, portable mini-electric pumps through to hospital-grade electric pumps.

Mini-electric pumps

These are more costly than manual pumps and are designed for more frequent and regular use. They are not recommended for full-time expressing. They can be useful for mothers working or studying part-time. Some allow for simultaneous (double) expressing to save time.

Hospital-grade electric pumps

Hospital-grade pumps are designed for full-time expressing, usually for a mother of a preterm or unwell infant or who is in full-time paid work or study. They are often used by mothers who need to increase their milk supply. They are expensive to buy and are usually hired from the Australian Breastfeeding Association, local pharmacies, pump hire companies or some hospitals.

Hospital-grade pumps enable simultaneous (double) expressing. Volumes of milk expression are not significantly higher during simultaneous expressing; however, this is an effective time-saving technique that may assist mothers to provide breastmilk, especially if expressing full-time [183].

Technique for use of electric pumps

- Follow general principles for expressing as above.
- Begin with hand expression to start the flow of milk.
- Centre the nipple in the breast pump shield and place the rim of the shield flat against the breast. The shield should be held firmly to create a seal but avoid pressing in to the breast.
- Set pump to quick cycles and low suction to begin if these settings are available.
- With let-down (flow of milk), change to medium cycles and increase pressure to whatever is the maximum comfortable pressure for the woman that allows good milk flow.
- Higher pressures do not necessarily mean more milk flow especially if this causes pain. There should be no pain or discomfort when using a breast pump.
- Change to the other breast when milk flow slows significantly. Change the pump settings back to quick cycles and low suction again, to begin expressing from the second side. Do this each time the pump is switched to the other breast. The pump can be alternated from breast to breast as often as required to maintain milk flow.
- Breast compression during pumping and hand expression at the end of pumping can facilitate breast drainage, which stimulates milk production.

Breast compression

This can be an effective technique to assist breast drainage during expressing, particularly as the milk flow starts to slow as the breast empties. Efficient drainage will stimulate milk production. Various methods of breast massage or compression have been described, [152] including:

- Placing the hand around the breast and gently squeezing and releasing; this should not hurt
- A downward rolling movement with the knuckles or the flat of the hand starting at the top and outer aspects of the breast and moving towards the nipple
- Stroking the breast with the fingers in a circular motion.

Whichever method is used, it should be done gently, by the mother, and should not cause pain.

Cleaning of expressing equipment

- Manufacturer's instructions should be followed to determine which components of milk collection systems need to be cleaned.
- It is not necessary to sterilise milk collection kits if used by only one mother; however, if the infant is preterm or unwell then many hospitals will advise mothers to sterilise equipment once every 24 hours.
- After each use, the milk collection kit should be rinsed in cold water, washed in warm soapy water, rinsed with warm water and left to air dry.
- Milk collection kits can usually be placed in a dishwasher – refer to manufacturer's instructions.
- Kits should be stored in a clean, covered container or a clean, sealed plastic bag.

Frequency and timing of expressing

Frequency will depend on the reason for expressing.

Expressing for a well infant

- If working, studying or temporarily separated, express when the infant would normally feed. This is important to maintain milk production and avoid blocked ducts and mastitis.
- Express after feeds to build up milk supply or to drain an overfull or inflamed breast.
- Express before feeds if the breast is so full that the infant can't attach.
- Express whenever convenient to store some milk to enable the mother to go out or have a rest.
- The general recommendation is to express soon after a breastfeed.

Expressing for a preterm or unwell infant

Early, frequent and regular breastmilk expression is the key to initiation and maintenance of lactation when infants are preterm or unwell. The aim is to express the volumes that would normally be obtained if breastfeeding a full-term infant, rather than what the preterm or unwell infant currently requires. The mother needs to establish and maintain an adequate milk supply until the infant starts or resumes breastfeeding.

Initiating lactation through expressing – the first few days after birth

- Start hand expressing as soon as possible after birth, and ideally within six hours.
- Teach the mother how to hand express and encourage her to express 8–12 times in 24 hours to mimic the normal patterns of a well, term infant feeding at the breast.
- If only a few drops are obtained, express directly onto a spoon or into a syringe and place directly in infant's mouth.
- If infant is stable, give frequent and prolonged skin-to-skin contact before and even during expressing.
- Before the milk comes in, the use of a hospital-grade electric breast pump on very low suction, in addition to hand expressing, may increase stimulation, but advise the mother that she may not collect any colostrum whilst using the pump.

Establishing the supply – days 3 to 10

- Frequent and effective milk removal is the key to establishing and maintaining milk production: frequency and thoroughness of milk removal are more important than the total length of time at each expression.
- Commence the use of an appropriate breast pump.
- Express both breasts at least 8–12 times per 24 hours for no longer than 20 minutes each time.
- Volumes will vary at each episode; reassure the mother this is normal. Aim for around 600–800ml/24 hours by day 10 (or 1000ml/24 hours for twins).

Choice of breast pump – preterm or unwell baby

- Infant is not breastfeeding or only minimal breastfeeds, longterm expression predicted (more than a week): use hospital-grade electric pump and suggest simultaneous expressing.
- Infant is having some breastfeeds and only short term predicted (less than a week): use hospital-grade or mini-electric pump.
- Infant is having most breastfeeds, mother needs to express only one or two feeds a day for short term: use mini-electric or manual pump.

Maintaining long-term expressing particularly for an unwell or preterm infant

- Continue frequent expressing and regular prolonged skin-to-skin and breast contact.
- Continue expressing at least once overnight.
- Recommend no longer than one 5-hour gap between expressing in a 24-hour period.
- Once the milk supply has been established, some mothers with an abundant or oversupply may reduce frequency of expressing to 6–8 times/24 hours.
- Keeping an expressing journal can help to identify fluctuations in milk volumes so that early remedial action can be taken, such as increasing frequency of expressing.
- If the milk supply is low, follow guidelines outlined in section about low milk supply.
- In addition, consider the following for a mother of an unwell or preterm infant:
 - increase frequency of expressing, including overnight
 - ensure mother is using the most appropriate breast pump
 - observe pumping technique and modify if required
 - consider double-pumping
 - increase skin-to-skin and breast contact
 - assess smoking and nutrition, maternal health and wellbeing, lifestyle issues, family support.

5.2 Storage of expressed breastmilk (EBM)

Expressed breastmilk is best used fresh; however, it can be safely stored for later use.

Preparation for storage

- Hands should be thoroughly washed with soap and water and dried carefully.
- Express breastmilk as per guidelines.

Storage containers

- Commercial breastmilk storage bags are a popular choice for mothers who are expressing regularly. To avoid possible contamination through puncturing, storage bags should be “sturdy, sealed well, and stored in an area where damage to the bag would be minimised” [184 p. 127].
- Hard plastic containers may also be used. Polypropylene containers are commonly used in hospital settings but bisphenol A (BPA) free infant bottles and food storage containers are suitable for home use.
- Glass containers may be used but care must be taken to avoid breakage and subsequent contamination.
- Containers do not need to be sterilised, but should be washed in warm soapy water, rinsed and air dried. They can be placed in a dishwasher. Containers should not be shared between mothers.

Adding EBM to containers

- EBM which has been cooled in the fridge can be added to already cooled or frozen EBM (cooling first prevents rewarming of the stored EBM).
- Label containers with date of collection, and if using in a childcare environment, with the infant's name (refer below to labelling guidelines for in hospital).
- If EBM is to be frozen, leave space at the top of the container for expansion. If practical, freeze in amounts that suit the age and fluid requirements of the infant (e.g. 50ml, 100ml, 150ml) to avoid wasting defrosted milk.
- The smell and taste of stored EBM may be altered due to enzyme activity. This is not harmful, but some babies may refuse it.

Table 16: Breastmilk storage guidelines for HOME [39, 184]

Breastmilk status	Storage at room temperature (26°C or lower)	Storage in refrigerator (5°C or lower)	Storage in freezer
Freshly expressed into container	6–8 hours If refrigeration is available store milk there	No more than 72 hours Store at back, where it is coldest	2 weeks in freezer compartment inside refrigerator (-15°C) 3 months in freezer section of refrigerator with separate door (-18°C) 6–12 months in deep freeze (-20°C)*
Previously frozen – (thawed)	4 hours or less; that is, the next feeding	24 hours	Do not refreeze
Thawed outside refrigerator in warm water	For completion of feeding	4 hours or until next feeding	Do not refreeze
Infant has begun feeding	Only for completion of feeding. Discard after feed.	Discard	Discard

*Chest or upright manual defrost freezer that is opened infrequently and maintains ideal temperature.

Breastmilk storage guidelines for HOSPITAL

Storage guidelines in hospital differ from home guidelines as follows:

- Fresh EBM can be stored for 48 hours in a refrigerator before being used, frozen or discarded. All other storage guidelines are as for home use.
- Many hospitals prefer to use single-use sterile containers for storage of breastmilk, particularly if EBM is to be used for preterm or unwell infants.
- Containers must be clearly labelled with infant's name, date of birth, date and time of collection, freezing and thawing.
- Before feeding, check the infant's identification label against label of EBM container, with a second person (member of midwifery, nursing or medical staff, or baby's parent).

Frozen EBM

EBM can be defrosted using the following methods:

- Defrost in the refrigerator overnight
- Hold under running warm water
- Sit the container in a container of warm water
- Defrosted EBM should not be re-frozen.

Warming and defrosting EBM

- EBM should not be defrosted or warmed in a microwave due to uneven heating. “Microwaving also significantly decreases the anti-infective quality of human milk, which may reduce its overall health properties for the infant” [184 p. 12]
- Once warmed or defrosted, EBM should not be re-heated or re-frozen.

Cooled or defrosted EBM

Cooled or defrosted EBM may be brought to room temperature or warmed by standing in a container of warm water; however, some infants are happy to drink it unwarmed.

Using stored EBM

- Use the oldest EBM first
- EBM may separate into layers whilst stored. Swirl container gently to mix before feeding
- Milk which has been warmed should be used immediately
- Discard any remaining milk within 1–2 hours after the baby is finished feeding
- Methods of feeding EBM will depend on the age of the infant and the reason for feeding EBM.

Transporting EBM

- Transport in an insulated container with a freezer brick or ice.
- Place in a fridge immediately after arrival, or in a freezer if still frozen.
- If frozen milk has already started thawing, do not re-freeze. Use within 24 hours.

5.3 Alternative feeding methods

When an infant is unable to breastfeed directly at the breast for any reason, a decision must be made regarding the most appropriate alternative method of feeding. Expressed breastmilk remains the optimum nutrition for infants unable to feed at the breast [184]. Choice of method will depend on a number of factors, including the age of the infant, stage of lactation, any associated feeding issues and parental preference.

The following techniques are described as a guide only. Clinicians should only implement these techniques if they have been trained in their use and should follow appropriate clinical practice guidelines or protocols.

Cup feeding

Cup feeding may be used as an alternative to bottles and teats for very young infants. Many infants are able to lap milk from a cup from around 30 weeks' gestation [185]. When cup feeding, the infant should be wrapped and held in a semi-upright position. The milk should not be poured into the mouth; the infant should control the rate of the feed. Allow the infant to

swallow and pause to breathe frequently. Cup feeding is not appropriate for infants who are lethargic, or those with a poor gag reflex. Cups should have a smooth, rounded edge, such as a small medicine cup [185, 186].

Dropper, syringe or spoon

These may be used to give small volumes (e.g. a few millilitres only) to the infant, typically in the first few days after birth if supplemental feeds are required, or the infant is sleepy and not attaching to the breast. The infant should be wrapped and held in a semi-upright position. When spoon feeding, allow the infant to pace the feed and lap from the spoon: do not tip milk into the mouth. If using a dropper or syringe, only small amounts of milk are given into the cheek area of the mouth. Allow the infant to swallow and pause to breathe frequently [185, 186].

Finger feeding

Finger feeding is often used to encourage a sleepy, lethargic or preterm infant to suck. The infant should be wrapped and held in a semi-upright position, or alternatively may be held skin-to-skin at the breast if the goal is to encourage attachment to the breast.

Ideally, the mother's clean finger is used, but gloves should be worn by health professionals. The index finger is gently placed into the infant's mouth with the pad facing upwards against the infant's palate. Gentle stroking or pressure on the palate may stimulate the infant to suck on the finger. As the infant starts to suck, a small amount of milk is drawn or delivered into the mouth to 'reward' the sucking efforts [185, 186].

The following methods can be used:

- A dropper or dental syringe containing milk is placed just inside the infant's mouth alongside the finger
- A feeding tube that is connected to a syringe or bottle containing milk is placed inside the infant's mouth alongside the finger.

Gastric tube feeding

Gastric tube feeding is used for preterm or unwell infants who do not have the ability to take any or all feeds from the breast. Gastric tube feeds can be given whilst the infant is held skin-to-skin or at the breast [185].

Supplemental feeder

A supplemental feeder allows the infant to receive additional milk whilst at the breast. They may be useful in situations of low milk supply, re-lactation, induced lactation, infants with neurological conditions and those with a weak suck. A fine tube is attached to the breast, alongside the nipple. The tubing is connected to a bottle or syringe containing milk. The infant attaches to the breast normally, and receives additional milk from the supplemental device as he/she suckles. Use of supplemental feeders should be guided by a clinician skilled in their use [185, 186].

Bottles and teats

The use of bottles and teats for breastfed babies remains a contentious issue. BFHI Step 9 'Give no artificial teats or dummies to breastfeeding infants' [28] is based on evidence associating their use with nipple confusion and shortened duration of breastfeeding [185]. It is not possible to predict which infants may have difficulties adjusting to the different sucking mechanisms of breastfeeding and bottle feeding [187].

If other, alternative, feeding methods are possible and practical, use of bottles and teats should be avoided, particularly for infants who have not yet established breastfeeding (e.g. preterm infants transitioning from gastric tube feeding to breastfeeding, sleepy non-attaching infants or infants who are experiencing other breastfeeding challenges) [185, 187].

Intermittent use of bottles and teats when breastfeeding is well-established for infants whose mothers are returning to work, studying or attending social engagements does not appear to have detrimental effects.

Speciality feeders

Speciality feeders are useful for infants with neurological or anatomical abnormalities that pose challenges for direct breastfeeding (e.g. cleft lip and palate, neurological impairments). Use of speciality feeders should be guided by a clinician skilled in their use.

5.4 Indications, preparation and use of infant formula

Breastfeeding is the optimal way to feed an infant; however, circumstances exist where infant formula is medically required by the infant, the mother is unable to provide breastmilk or it is requested by parents. A mother's decision not to breastfeed should be respected; where appropriate, clinicians should explore the reasons for the mother's decision. Donor breastmilk is the next best alternative after mother's own milk for infants requiring additional milk but donor breastmilk banks are not available in all areas. In addition, the provision of donor breastmilk is normally reserved primarily for preterm and sick infants; that is, < 32 weeks' gestation and less than 1500g birth weight (Personal communication, K McEgan, Manager, Mercy Breastmilk Bank, 18 June 2012).

It has been difficult for health professionals to have a clear understanding of all available infant formulas as clear, objective and comprehensive information about infant formula is lacking [188]. Studies have also indicated that parents, carers and health professionals do not prepare infant formula correctly; it is imperative that health professionals are trained and parents are instructed appropriately [189]. The following information is general in nature and could be applied to circumstances where infant formula is being used for both medical and non-medical indications.

Powdered infant formula

Health professionals should re-emphasise to parents and carers:

- That powdered infant formula is not sterile and good hygiene practices are essential in preparing and storing feeds made from powdered formula
- Failure to follow the manufacturer's guidelines may increase the chances of a baby becoming ill [190-192]
- Where a donor human breastmilk bank does not exist, preterm and sick infants requiring supplemental infant formula in addition to breastmilk should be provided with sterile ready-to-feed formula, thus avoiding the risks associated with powdered infant formula [193].

Medical indications for infant formula may include:

- Low birth weight < 2.5 kg birth weight
- Infants with diagnosed hypoglycaemia
- Prematurity
- Mother unable to supply adequate breastmilk due to maternal ill health or inadequate breastmilk supply
- Infant metabolic disorders not compatible with breastmilk (rare)
- Where mothers should avoid breastfeeding (either temporarily or permanently) such as HIV infection, maternal medications incompatible with breastfeeding (rare), or other maternal illness [194].

Choice of formula

The composition of each brand of term infant formula is similar—one is not necessarily better than another [39]. Cow's milk-based formula is suitable for most healthy full-term infants and is recommended above formulas made from soybeans, goat's milk or modified lactose formula. Special formula designed for infants with nutritional problems should be used only in the case of medically diagnosed conditions on the advice of a paediatrician. Changing the type of formula because of minor rashes, irritability or infant or parent distress is usually of no benefit [39]. (Refer to NHMRC Infant Feeding Guidelines Section 8.5.1 for more detail on soy milk-based, goat milk-based formulas [39]). A review of trials found no evidence to support feeding with a hydrolysed formula to prevent allergy in preference to exclusive breastfeeding. In infants at high risk of allergy who are unable to be completely breastfed, there is limited evidence that feeding with a hydrolysed formula compared to a cow's milk formula reduces allergies in babies and children, including cow's milk allergy [195, 196]. The use of 'follow-on formula' for infants aged 6–12 months is not considered necessary and no studies have shown advantages over using 'infant formula' [39].

Parents who choose to feed infants with infant formula or who are not exclusively breastfeeding must be able to prepare infant formula to a standard that will maintain their infant's health. Parents indicating that they will use infant formula at home should be asked to bring their chosen formula into hospital to facilitate learning about formula preparation. The correct method of preparation of formula must be demonstrated to parents individually using the parents' chosen infant formula; parents should have supervised infant formula preparation practice during their postnatal stay in maternity or neonatal unit prior to discharge.

Volumes of formula

A healthy term infant will usually be taking about 30 ml/kg of infant formula in the first 24 hours; that is, a 3.5 kg infant should be averaging 105 ml per 24 hours—approximately 9–17mls every 2–4 hours. The amount the infant takes at each feed may vary.

Volume of infant formula per day for infants who are exclusively formula feeding or infants requiring medically indicated infant formula [194]:

Table 17: Average recommended volumes of infant formula [39, 194]

Age of baby	Feed volumes for infant formula for feeding a term healthy infant	Feed volumes for infant formula feeding preterm infant birth weight 1500–2500 (recommended only)
0–24 hrs*	30 ml/kg/day	60 ml/kg/day
24–48 hrs	60 ml/kg/day	80 ml/kg/day
48–72 hrs	80 ml/kg/day	100 ml/kg/day
72–96 hrs	100 ml/kg/day	120 ml/kg/day
96–120 hrs	120 ml/kg/day	140 ml/kg/day
120–144 hrs	150 ml/kg/day	160 ml/kg/day
Day 5–3 months**	150 ml/kg/day	
3–6 months	120ml/kg/day	
6–12 months	100ml/kg/day	
	[day 5–12m] [39]	

*RWH

**NHMRC

Note: these volumes do not apply to well, term exclusively breastfeeding babies

Example calculation:

For a healthy term infant taking in 30 ml/kg of infant formula in the first 24 hours:

$$30\text{mL} \times 3.5\text{kg} = 105\text{mL per 24 hours}$$

Therefore, approximately 9–17mls every 2–4 hours. The amount the infant takes at each feed may vary.

Preparation of formula

Recent concerns about the presence of pathogens in Powdered Infant Formula (PIF) have prompted organisations to review practices regarding the preparation of infant formula. In 2007 the World Health Organization (WHO) developed new guidelines on the safe preparation of infant feeds [191]. These preparation guidelines recommend that formula is prepared:

- One bottle at a time when the infant is ready to feed
- Using sterile bottles and equipment
- Taking care to avoid scalds; pouring the appropriate amount of boiled water that has been allowed to cool to no less than 70°C, into a cleaned and sterilised feeding cup or bottle. To achieve this temperature, the water should be left for no more than 30 minutes after boiling
- To the water, add the exact amount of formula as instructed on the label; shake or swirl to mix thoroughly
- Immediately after preparation, quickly cool the feed to feeding temperature by holding the bottle under running tap water, or by placing in a container of cold or iced water
- Discard any feed that has not been consumed within 2 hours of preparation.

The 2012 NHMRC Infant Feeding Guidelines have identified that incorrect preparation of powdered infant formula poses significant risks for babies. At a minimum, parents should be advised to prepare infant formula according to NHMRC guidelines (as prescribed by the Infant Nutrition Council Ltd, [an amalgamation of the Infant Formula Manufacturers' Association of Australia, and the New Zealand Infant Formula Marketers' Association]). Some parents may wish to further reduce the risk of potential pathogens in infant formula by preparing the formula according to WHO guidelines.

Teats and flow rates

Check the flow rate of the teat—it should drip steadily, not stream, when infant formula is at room temperature.

Safety aspects

Before giving a bottle, always check the temperature of the feed by shaking a little formula from the teat onto the inside of the wrist to check it is not too hot. Advise parents of risks of burns with hot fluids and to ALWAYS check the temperature of infant formula or breastmilk just prior to giving to infant.

Warn parents of the danger of ‘propping’ a bottle in the infant’s mouth and walking away. The formula may flow too quickly and cause the infant to choke. Infants who often feed on their own are at greater risk of ear infections and tooth decay [197, 198]. It is important that infants are held by a caregiver when being fed so that interaction can also occur between the infant and the caregiver.

5.5 Breastmilk banks in Victoria

Donor milk banks exist to collect, screen, pasteurise and distribute breastmilk to infants whose mothers are unable to supply enough breastmilk for their sick or preterm infant. There is strong evidence for the benefits of breastmilk including donor breastmilk, particularly in the preterm population [5, 6, 199]. In Victoria only one donor breastmilk bank exists in 2013—the Mercy Health Breastmilk Bank—and it provides donor breastmilk from screened volunteer milk donors to infants who are less than 1500 grams birth-weight or less than 32 weeks' gestation at birth in the NICU at the Mercy Hospital for Women. They are currently unable to supply breastmilk for other hospitals (personal communication K McEgan. Manager Mercy Health Breastmilk Bank, 2013). Stringent guidelines exist for donor screening, collection, pasteurisation, bacterial screening, storage and administration of donor breastmilk [200].

Breastmilk from screened or unscreened donors and unpasteurised donor breastmilk presents a risk of transmission of infectious agents to babies, therefore the use of unscreened, unpasteurised human breastmilk is not recommended. Unpasteurised and unscreened donor human breastmilk can expose the baby to infections such as HIV1 or 2, hepatitis B or C, human T cell lymphotropic virus (HTLV) type 1 or 2, or syphilis. It should also be recognised that infant formula carries some risk for all babies, which must be balanced against the risks of unscreened, unpasteurised donor human milk.

Some mothers are not able to produce sufficient breastmilk for their baby and may request that donor human breastmilk be used; often the donor is a lactating friend or family member. Informal breastmilk sharing networks exist in Victoria and it is important that health professionals are aware if they are being used [201]. If a woman indicates that she intends to use unscreened, unpasteurised donated breastmilk the health professional should recommend that the woman consider potential risks of unscreened breastmilk and consider asking for the donor to be screened for the infections listed above.

If donor milk is being used for an infant, the routine expressing hygiene and storage standards should be applied.

6 Continuing breastfeeding

6.1 Medicines and breastfeeding

Women seek medical care during the postpartum period for various common health problems. Most medicines can be used safely at the recommended dose during breastfeeding. Women should avoid using medicines, including complementary and over-the-counter medicines, unnecessarily. Whenever possible, it is advisable to use topical or local treatments such as eye drops or inhalers. As milk production is limited in the first few days postpartum, breastfed infants receive little maternal medicine at that time. It should be remembered that fetal exposure during pregnancy is five- to ten-fold higher than that of breastfed infants [202].

Medicines considered safe to use in infants are generally considered safe to use in breastfeeding women. The relative infant dose is less than 10% for medicines; thus considered compatible with breastfeeding [202]. It may be possible to choose medicines with characteristics that reduce transfer to infants; that is, medicines with short half-lives, high protein binding, low oral bioavailability and high molecular weight.

Caution is required with premature or low birth weight infants, and particularly when multiple medicines are being taken by the mother. With certain medicines (i.e. radioactive compounds), sometimes discontinuing breastfeeding for hours/days may be required. Infants of mothers taking psychotropic medicines or opioids, including codeine, need to be monitored for excessive drowsiness [203]. Women requiring opioids more than four days postpartum should be assessed by medical staff [204].

Medicines to avoid during lactation include [138]:

- Antineoplastic agents
- Ergotamine
- Methotrexate
- Radiopharmaceuticals.

Many women often use herbal preparations to treat viral infections and depression and to increase breastmilk production. However, there is little published evidence to support their effectiveness or safety. The following commonly used complementary medicines are not recommended for use by breastfeeding women due to lack of evidence [138]:

- Devil's claw (*Harpagophytum procumbens*)
- Dong quai (*Angelica sinensis*)
- Feverfew (*Tanacetum parthenium*)
- Ginkgo (*Ginkgo biloba*)
- Goldenseal (*Hydrastis canadensis*)
- Hawthorn (*Crataegus oxyacantha*)
- Horse chestnut (*Aesculus hippocastanum*)
- Marigold (*Calendula officinalis*).

The risks of a breastfeeding mother taking medicine need to be managed by balancing the need to treat the mother for a medical condition and concurrently supporting the breastfeeding of the infant [138]. Some easily available resources exist when considering the use of medicines in breastfeeding women (see Resource section below).

6.2 Drug and alcohol use and breastfeeding

The *National Clinical Guidelines for the Management of Drug Use during Pregnancy, Birth and the Early Development Years of the Newborn* have adopted a harm minimisation approach when considering breastfeeding and drug use [205]. These guidelines are a key source of guidance for clinicians and are available online for reference (see Resource list below). The

guidelines state that women ‘who are drug dependent should be encouraged to breastfeed with appropriate support and precautions . . . Encouraging breastfeeding is preferred to avoiding breastfeeding providing that:

- The woman is informed about the likely effects on the infant of the drugs that she is using or may use
- The woman is assisted to plan minimum exposure of the infant to the effects of these drugs.’ [205 p. 19].

In each individual circumstance potential risks need to be weighed against the benefits of breastfeeding for the woman and her baby. Polydrug use is common in this population and the effects of tobacco and alcohol should be considered with other drug use [206].

During the antenatal period, the woman should be referred to supportive drug and alcohol maternity services that can consider the individual needs and concerns of the woman, the health of the woman and her baby [207]. Individual pharmacological advice should be sought from sources such as Monash Medical Centre Pharmacy or the Royal Women’s Hospital Medicines Information Centre (see Resource list). Factors that should be considered are maternal drug use, substance abuse treatment history, medical and psychiatric history, infant health status, family support or lack of it, community support and follow-up care. Individual care plans with planned monitoring can be developed in partnership with the woman, with input from health professionals specialised in drug and alcohol services, paediatricians and lactation consultants.

For some women it may be reasonable to consider taking the approach that the woman ‘express breastmilk and discard’ if she takes a drug that was unplanned rather than advising that she must not breastfeed at all. However, consideration must be given to the safe care of the infant if the mother has impaired judgement due to drug use.

Alcohol

Alcohol passes into breastmilk within 30 minutes of consumption. However, alcohol is not “stored” in the breast—it passively diffuses out of milk into the blood; it lowers as maternal blood alcohol lowers. One standard alcoholic drink would be cleared from the maternal circulation (and breastmilk) within two hours of ingestion [208]. It is best for breastfeeding women to avoid alcohol in the first month after birth [208]. There is no evidence of any negative effects from occasional intakes of one to two drinks per day. Once breastfeeding is well-established, women can drink one or two glasses occasionally aiming to maximise the time between drinking alcohol and the next breastfeed; if planning to drink heavily women should avoid breastfeeding while blood alcohol is high [209].

Tobacco

Health policies support breastfeeding when the mother is a smoker, while strongly encouraging smoking cessation or reduction [98, 210]. The breastfed infant absorbs very little nicotine from mother’s milk, and has a significantly reduced chance of respiratory illness if breastfed compared to being formula fed [211]. While mothers who smoke may believe formula feeding is safer or cleaner than breastfeeding [212], health professionals “need to make it clear that breastfeeding is better and safer” [213].

6.3 Sexuality, contraception and breastfeeding

6.3.1 Sexuality

Many factors affect women’s sexual function in the postpartum period. In addition to healing perineal trauma/caesarean wound and the fatigue associated with life with a young baby, breastfeeding women experience profound hormonal changes [214]. High levels of prolactin result in decreased levels of androgen and oestrogen. Low oestrogen levels are associated with poor vaginal lubrication, and dyspareunia (pain during intercourse) is common [215]. Clinicians should inform women about the

physiological hypoestrogenic changes, and encourage vaginal lubricants during or prior to vaginal intercourse [214]. Women may prefer to avoid breast stimulation, due to nipple and breast sensitivity during lactation. Clinicians can educate couples about potential for the milk ejection reflex associated with oxytocin release at the time of female orgasm. While many women experience decreased libido when lactating, others find their libido is enhanced.

6.3.2 Contraception

The Academy of Breastfeeding Medicine presents the following advice on choosing contraceptives in order to minimise the physiologic impact on breastfeeding [216]:

First choice: lactational amenorrhea method (LAM), ‘natural’ family planning, barriers, non-hormonal intrauterine device (IUD)

Second choice: progestrone only methods

Third choice: oestrogen containing contraceptives.

Lactational amenorrhea method

Breastfeeding is used as a contraceptive method by many women who are amenorrhoeic and not feeding supplements to the infant for up to six months after birth. The lactational amenorrhoea method (LAM) provides 98% protection from pregnancy if the following three conditions are strictly met [216]:

- Full breastfeeding (no breast milk substitutes – water, glucose water, formula, juices, solids)
- No return of menstruation
- The baby is under six months of age.

When the infant starts on solids or fluids, or the woman’s periods return, or the infant reaches six months of age, the risk of pregnancy increases and other methods of contraception need to be considered. The reliability of fertility control offered by prolonged breastfeeding is uncertain.

Hormonal methods

Progestogen-only contraceptives (“minipill”, intra-uterine device or implant) are compatible with lactation but should not be initiated before six weeks postpartum. Anecdotally, some women report a noticeable reduction in milk supply after starting the minipill. This may be overcome by increasing feeding frequency for a time.

The combined oral contraceptive pill should not be used in the first six months postpartum, but can be offered to women with well-established lactation (> six months) [138, 217].

6.4 Dietary advice

A ‘perfect’ diet is not required for breastfeeding; the diet is important for the mother’s own health and energy levels, rather than affecting the breastmilk and the infant. The nutritional value of breastmilk remains fairly constant despite the mother’s diet [218]. There is no evidence for specific foods upsetting the infant or causing gas or wind in infants, so mothers need not restrict their diet. Breastfeeding women should avoid ‘bingeing’ on any food or drinks. Consuming a variety of foods and all foods and drinks in moderation is a good rule.

Lactation does not change nutrient requirements significantly as maternal adaptations tend to compensate. However, attention should be paid to the following nutrients [219]:

- Energy – energy requirements vary significantly between individuals, but on average increase by 2.0–2.1 MJ/day (470 – 500 Kcals) per day. The best advice is to eat according to appetite.
- Calcium – calcium is not required in higher amounts due to maternal adaptations during lactation. However, it is important that the mother is meeting her minimal requirement of 1000 mg per day or 1300mg for < 19 year olds.
- Iron – iron requirements do not increase during lactation but adequate iron intake is important to replenish iron stores after pregnancy.
- Iodine – iodine is present in many foods but only in small amounts; as a result, iodised salt must be used in the manufacture of all breads except organic breads. However, it is recognised that this will not fully meet the needs of pregnant and breastfeeding women. The National Health and Medical Research Council (NHMRC) recommends that all pregnant and breastfeeding women take an iodine supplement of 150 micrograms each day.

Table 18: Guide to adequate food intake during lactation

Food group	Number of serves	Sample serve
Meat or alternatives	2 ½	65g cooked red meat 80g cooked poultry 100g cooked fish 2 eggs 1 cup legumes 30g nuts
Dairy	2 ½ 4 (< 19 year old)	250ml milk 200g yoghurt 40g cheese
Breads and cereals	9	1 slice bread 2/3 cup cereal flakes ½ cup cooked porridge ½ cooked cup rice, pasta, noodles
Food group	Number of serves	Sample serve
Fruit	2	1 medium fruit (e.g. apple) 2 small pieces of fruit (e.g. plums)
Vegetables	7 ½	1 cup stewed or tinned fruit ½ cup vegetables 1 cup salad
Unsaturated fats & oils	Have in small amounts	Poly and monounsaturated margarines and oils
Extra foods	Only sometimes and in small amounts	Fried foods, cakes, biscuits, confectionary, fruit juice and soft drinks

For more information go to <http://www.eastforhealth.gov.au/>

In cases of a strong family history of allergies and food intolerances, special dietary advice from a professional dietitian and/or medical allergist may be necessary. Recent research suggests that excluding allergenic foods from a mother's diet during pregnancy or breastfeeding does not help prevent infants from developing allergies [220]. A low allergen maternal diet may occasionally be recommended if infants develop symptoms of colic earlier than six weeks and other causes of being unsettled have been excluded [221].

Special dietary advice should be sought for breastfeeding mothers with specific needs:

- Vegetarian/vegan mothers
- Mothers with severe dietary restrictions
- Pre-existing medical conditions affecting nutrition (i.e. renal, liver, Crohn's and coeliac disease, type 1 diabetes)
- Bariatric surgery (in particular gastric bypass surgery) [222, 223]
- Exclusion diets for infant allergies
- Breastfeeding multiples
- Poor nourishment before and during pregnancy
- Weight management advice.

Women trying to return to their pre-pregnant weight should be encouraged to keep high-fat, high-sugar foods to a minimum and include some regular exercise. Strict dieting or skipping meals is not recommended. While breastfeeding, it is best to lose the extra weight gradually; a loss of up to about 0.5 kilogram per week is suggested [218].

Lactating women do not need to drink large amounts of fluids. "If she drinks enough to meet her own thirst needs, she will drink enough to sustain lactation" [218 p. 499]. Most breastfeeding mothers can consume a moderate amount of caffeine (e.g. a few cups of coffee each day) without ill-effect on their infants. About 1% of the amount of caffeine consumed gets into the mother's breastmilk.

Vitamin D and breastfeeding

Vitamin D deficiency can cause bone weakness, muscle pain and skeletal abnormalities; that is, rickets in infants. At-risk pregnant women should be screened and treated for Vitamin D deficiency [224]. Breastfed infants of women with Vitamin D deficiency need a vitamin D supplement (400 IU daily), such as Pentavite,TM or Osteo VitTM for the first 12 months of life [225, 226].

6.5 Working and breastfeeding

Increasingly, more Australian women are returning to work within six months of giving birth [227]. Australian data have shown that return to paid work part-time as well as full-time is a cause for ceasing or reduced breastfeeding [228]. The timing of return to work may influence the challenges the breastfeeding mother may encounter and the length of time she may have to deal with them. Possible challenges "include [229 p. 557]:

- Concern about an inadequate or fluctuating milk supply
- Possible engorgement
- Possible leaking
- Baby's need for frequent feedings
- Baby's frequently changing feeding patterns, including appetite spurts and night-time nursing."

To successfully encourage and combine breastfeeding and paid work, a coordinated approach commencing in pregnancy is required. Discussing with the woman early in the pregnancy about her future employment/study plans may encourage

continuing breastfeeding, as it provides an opportunity to identify and discuss any specific individual and workplace needs. Women should be informed that it is worthwhile to continue any amount of breastfeeding.

Health care professionals can discuss with the woman:

- Her plans about when to return/not return to work after childbirth and whether this will be full-time or part-time work
- Breastfeeding goals after considering factors such as length of maternity leave, work circumstances and amount of support available
- Frequency of milk expression or pumping when a mother returns to work (depends on circumstances; for example, age of the baby, duration of separation)
- Exclusive or partial breastmilk feeding upon returning to work and whether breastmilk substitute is used/how much (the infant's age will determine the need and frequency of milk expression)
- Decisions regarding child care services and options
- Assessing workplace support for breastfeeding and expressing.

“Ways to continue breastfeeding after the mother returns to work include [229 p. 558]:

- Hand expressing breastmilk
- Breast pumping
- Having the baby brought to the mother during meal breaks
- Substituting formula for those feedings that occur during the mother’s workday.”

Health care professionals need to be aware of critical influences (i.e. partners, woman’s confidence) and adjust accordingly to facilitate continuing breastfeeding after return to work. It is usually the woman’s responsibility to discuss with her employer her plans for return to work and breastfeeding. Health care professionals should provide information and advocate for women to breastfeed and continue paid work. Information is available for women returning to work or study; see the Australian Breastfeeding Association’s website for list of points for women to discuss with employers and guide for carers of breastfed infants [230].

6.6 Breastfeeding during pregnancy and tandem breastfeeding (feeding an infant and an older child)

Some women will become pregnant while they are breastfeeding; however, most of these pregnancies will occur when the breastfeeding infant is older than 6 months and therefore not totally reliant upon their mother for all their nutritional requirements. Older infants or toddlers may be having a significant number of breastfeeds per day or as little as one breastfeed per day. Some woman will be happy to continue to breastfeed during the pregnancy but may seek advice about the practicalities of breastfeeding in pregnancy and breastfeeding a newborn baby and a toddler.

If the woman is experiencing a healthy pregnancy there is no reason to advise her to wean the toddler. Little research has been conducted in the field, but breastfeeding during pregnancy is thought to pose no increased risk to the pregnancy [231]. However, as with all such discussions, it is important to discuss what is known about breastfeeding and pregnancy and what is not known, especially if risk factors exist in her pregnancy. Risks factors such as a history of miscarriage, previous preterm birth, and current pregnancy complications should be considered, along with other relevant medical history, when the midwife, obstetrician/GP and woman consider whether or not to continue breastfeeding in pregnancy. Where no pregnancy risk factors exist the decision to continue or not is up to the mother.

Women who do continue to breastfeed in pregnancy will cite breast and nipple pain as the most common reason for stopping breastfeeding while pregnant [232]. Women who breastfeed during pregnancy may experience [152]:

- Nipple and/or breast tenderness
- Decline in milk supply
- Change in milk taste – as described by breastfeeding toddlers
- Uterine contractions while breastfeeding
- Weaning – some toddlers will wean themselves.

When a woman decides to breastfeed during pregnancy, routine maternal nutritional advice of pregnancy and lactation should apply. It is thought that women who breastfeed during pregnancy will still have colostrum production in the early postpartum phase [231]. When the infant is born the newborn infant should always breastfeed before the older infant to ensure the newborn infant gets adequate intake. It is not necessary for the mother to reserve one breast for each infant/child. The Australian Breastfeeding Association has breastfeeding information and provides face-to-face, online and telephone counselling about breastfeeding through pregnancy and tandem feeding for women [233].

6.7 Breastfeeding while introducing solids

When a woman is introducing solids to her infant's diet it is important she receives good breastfeeding advice that will support ongoing breastfeeding—the infant's major source of nutrition. Breastfed infants are exposed to different flavours via the changing flavours of breastmilk [234], and it is thought that breastfeeding assists with the acceptance of the flavours of solid foods [235].

Starting solids is not a replacement of breastfeeding but an addition to breastfeeding. Many infants will resist the early attempts of solids until they are developmentally ready to accept foods [236]. Since solids may start out being as little as one teaspoon per day, solid foods will initially comprise little nutritional value for the infant. The introduction of solids is both experiential and nutritional for the infant and infants will play with, squeeze, and throw their food as they experiment with eating. It is important that when introducing solids the infant is breastfed before solids are offered. This will ensure that the mother maintains an adequate breast milk supply and the infant receives their major source of nutrition when they are most ready to feed. If an infant spends a long time playing with rather than eating solids, the risk of nutritional inadequacy exists if the infant becomes too tired to breastfeed well. Poor breastfeeding will reduce breast stimulation for the woman and potentially cause a reduction in her milk supply. However, as the infant becomes accustomed to eating solids and is able to take solids in quantities that will add to the nutritional intake required per day, the breastfeed can be offered after the solids [237]. For suggested types and timing of introduction of solid foods refer to the NHMRC's *Infant Feeding Guidelines for Health Workers* [39]. The guidelines provide specific information on introducing solids in allergic families [39].

Appendix 1

Acceptable medical reasons for use of breast-milk substitutes

Text from WHO and UNICEF 2009 publication WHO/NMH/NHD/09.01

WHO/FCH/CAH/09.01

http://whqlibdoc.who.int/hq/2009/WHO_FCH_CAH_09.01_eng.pdf

Introduction

Almost all mothers can breastfeed successfully, which includes initiating breastfeeding within the first hour of life, breastfeeding exclusively for the first 6 months and continuing breastfeeding (along with giving appropriate complementary foods) up to 2 years of age or beyond.

Exclusive breastfeeding in the first six months of life is particularly beneficial for mothers and infants.

Positive effects of breastfeeding on the health of infants and mothers are observed in all settings. Breastfeeding reduces the risk of acute infections such as diarrhoea, pneumonia, ear infection, *Haemophilus influenza*, meningitis and urinary tract infection (1). It also protects against chronic conditions in the future such as type I diabetes, ulcerative colitis, and Crohn's disease. Breastfeeding during infancy is associated with lower mean blood pressure and total serum cholesterol and with lower prevalence of type-2 diabetes, overweight and obesity during adolescence and adult life (2). Breastfeeding delays the return of a woman's fertility and reduces the risks of post-partum haemorrhage, pre-menopausal breast cancer and ovarian cancer (3).

Nevertheless, a small number of health conditions of the infant or the mother may justify

recommending that she does not breastfeed temporarily or permanently (4). These conditions, which concern very few mothers and their infants, are listed below together with some health conditions of the mother that, although serious, are not medical reasons for using breast-milk substitutes.

Whenever stopping breastfeeding is considered, the benefits of breastfeeding should be weighed against the risks posed by the presence of the specific conditions listed.

Infant conditions

Infants who should not receive breast milk or any other milk except specialized formula

- Infants with classic galactosemia: a special galactose-free formula is needed.
- Infants with maple syrup urine disease: a special formula free of leucine, isoleucine and valine is needed.
- Infants with phenylketonuria: a special phenylalanine-free formula is needed (some breastfeeding is possible, under careful monitoring).
- Infants for whom breast milk remains the best feeding option but who may need other food in addition to breast milk for a limited period.
- Infants born weighing less than 1500 g (very low birth weight).
- Infants born at less than 32 weeks of gestational age (very pre-term).
- Newborn infants who are at risk of hypoglycaemia by virtue of impaired metabolic adaptation or increased glucose demand (such as those who are preterm, small for gestational age or who have experienced significant intrapartum hypoxic/ischaemic stress, those who are ill and those whose mothers are diabetic) (5) if their blood sugar fails to respond to optimal breastfeeding or breast-milk feeding.

Maternal conditions

Mothers who are affected by any of the conditions mentioned below should receive treatment according to standard guidelines.

Maternal conditions that may justify permanent avoidance of breastfeeding

- HIV infection:¹ if replacement feeding is acceptable, feasible, affordable, sustainable and safe (AFASS) (6).
- Maternal conditions that may justify temporary avoidance of breastfeeding.
- Severe illness that prevents a mother from caring for her infant; for example, sepsis.
- Herpes simplex virus type 1 (HSV-1): direct contact between lesions on the mother's breasts and the infant's mouth should be avoided until all active lesions have resolved.
- Maternal medication:
 - sedating psychotherapeutic drugs, anti-epileptic drugs and opioids and their combinations may cause side effects such as drowsiness and respiratory depression and are better avoided if a safer alternative is available (7)
 - radioactive iodine-131 is better avoided given that safer alternatives are available – a mother can resume breastfeeding about two months after receiving this substance
 - excessive use of topical iodine or iodophors (e.g. povidone-iodine), especially on open wounds or mucous membranes, can result in thyroid suppression or electrolyte abnormalities in the breastfed infant and should be avoided
 - cytotoxic chemotherapy requires that a mother stops breastfeeding during therapy.

Maternal conditions during which breastfeeding can still continue, although health problems may be of concern

- Breast abscess: breastfeeding should continue on the unaffected breast; feeding from the affected breast can resume once treatment has started (8).
- Hepatitis B: infants should be given hepatitis B vaccine, within the first 48 hours or as soon as possible thereafter (9).
- Hepatitis C.
- Mastitis: if breastfeeding is very painful, milk must be removed by expression to prevent progression of the condition (8).
- Tuberculosis: mother and baby should be managed according to national tuberculosis guidelines (10).
- Substance use² (11):
 - maternal use of nicotine, alcohol, ecstasy, amphetamines, cocaine and related stimulants has been demonstrated to have harmful effects on breastfed babies
 - alcohol, opioids, benzodiazepines and cannabis can cause sedation in both the mother and the baby.

Mothers should be encouraged not to use these substances, and given opportunities and support to abstain.

¹ The most appropriate infant feeding option for an HIV-infected mother depends on her and her infant's individual circumstances, including her health status, but should take consideration of the health services available and the counselling and support she is likely to receive. Exclusive breastfeeding is recommended for the first six months of life unless replacement feeding is AFASS. When replacement feeding is AFASS, avoidance of all breastfeeding by HIV-infected women is recommended. Mixed feeding in the first 6 months of life (that is, breastfeeding while also giving other fluids, formula or foods) should always be avoided by HIV-infected mothers.

² Mothers who choose not to cease their use of these substances or who are unable to do so should seek individual advice on the risks and benefits of breastfeeding depending on their individual circumstances. For mothers who use these substances in short episodes, consideration may be given to avoiding breastfeeding temporarily during this time.

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237. **When to introduce solids** [http://raisingchildren.net.au/articles/when_to_introduce_solids.html/context/232]

Resources

Cleft lip and palate information:

Royal Children's Hospital:

http://www.rch.org.au/emplibrary/kidsinfo/6_Cleft_lip_and_palate_booklet.pdf

http://www.rch.org.au/emplibrary/kidsinfo/13_Infant_feeding_booklet.pdf

Australian Breastfeeding Association:

<https://www.breastfeeding.asn.au/bfinfo/cleftpalate.html>

Infant formula

<http://www.unicef.org.uk/BabyFriendly/Parents/Resources/Resources-for-parents/>

[Preparing-a-bottle-feed-using-baby-milk-powder/](http://www.unicef.org.uk/BabyFriendly/Resources/Resources-for-parents/Sterilising-baby-feeding-equipment/)

<http://www.unicef.org.uk/BabyFriendly/Resources/Resources-for-parents/Sterilising-baby-feeding-equipment/>

<http://www.who.int/foodsafety/publications/micro/pif2007/en/index.html>

Medicines and Breastfeeding Resources

National Clinical Guidelines for the Management of Drug Use during Pregnancy, Birth and the Early Development Years of the Newborn:

http://www.health.nsw.gov.au/pubs/2006/pdf/ngc_druguse.pdf

Medicines and breastfeeding telephone services:

- Pharmacists at tertiary maternity hospitals

Online information:

- Academy of Breastfeeding Medicine Clinical Protocols: <http://www.bfmed.org/Resources/Protocols.aspx>
- LactMed (an American based online database): <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT>
- Perinatal Psychotropic Medicine Information Service (PPMIS): <http://www.ppmis.org.au/>

Publications:

- *Pregnancy and Breastfeeding: Medicines Guide* (Royal Women's Hospital, Pharmacy department):
http://www.rch.org.au/chas/pubs/index.cfm?doc_id=1003
- Therapeutic Guidelines: <http://www.tg.org.au/>
- *Australian Medicines Handbook*: <https://shop.amh.net.au/>

Down syndrome breastfeeding resources

Australian Breastfeeding Association:

<https://www.breastfeeding.asn.au/bf-info/down>

Dietary advice

<http://www.eastforhealth.gov.au/>

Websites about pregnancy and parenting

Austprem

www.austprem.org.au

By families who have experienced the challenge of parenting a premature infant. Includes information about emergency caesarean birth premature babies.

Australian Breastfeeding Association

www.breastfeeding.asn.au

Informative and reputable site run by mothers for mothers; women supporting each other with a common interest in breastfeeding.

Australian Multiple Birth Association

www.amba.org.au

For families with twins, triplets, quadruplets or more.

Support from 'those who know'.

Better Health Channel

www.betterhealth.vic.gov.au

Health information site of the Victorian Government. Includes information about pregnancy and parenting, links to more complex information, and access to practitioners and support groups.

3 Centres Collaboration

www.3centres.com.au

Collaborative site of three major hospitals in Melbourne – the Royal Women's Hospital, Monash Medical Centre and Mercy Hospital for Women – which provides guidelines on pregnancy care.

Child and Youth Health

www.cyh.com.au

An independent state government health unit, funded primarily by the Victorian Department of Human Services. Features more than 300 articles about child health and parenting.

Cochrane Consumer Network

www.cochrane.org/consumers

Comprehensive information and review of journal articles on all aspects of birth.

Kidsafe

www.kidsafe.com.au

Site of the Child Accident Prevention Foundation of Australia.

NSW Multicultural Health Communication Service

www.mhcs.health.nsw.gov.au

Wide range of health information in English and other languages.

[Post and Antenatal Depression Association \(PaNDA\)](#)

www.panda.org.au

Support and information for women and their families who are affected by postnatal and antenatal depression.

[Raising Children website](#)

www.raisingchildren.net.au

An excellent Australian parenting website with parenting information from newborns to school age children.

[Community support and information services](#)

[Australian Breastfeeding Association \(ABA\)](#)

(03) 9885 0855

[ABA 24-hour Breastfeeding Help Line](#)

1800 686 268

[Australian Centre for Grief and Bereavement](#)

(03) 9265 2100

[Australian Multiple Birth Association](#)

Victorian branch

1300 866 499

[Caroline Chisholm Society](#)

(For assistance with material resources)

(03) 9370 3933

Country callers

1800 134 863

[CleftPALS \(Cleft Lip and Palate Victoria\)](#)

0425 784 130

[Centrelink](#)

136 150

[Down Syndrome Association of Victoria](#)

1300 658 873

[Immunisation Information Line](#)

1800 671 811

[Lactation Consultants of Australia and New Zealand](#)

(02) 9431 8621

[Lifeline](#)

131 114

Maternal and Child Health Line

(24-hour telephone and information service)

132 229

O'Connell Family Centre (Canterbury)

(03) 8416 7600

PaNDA (Post and Antenatal Depression Association)

(03) 9428 4600

1300 726 306

Parentline

132 289

Poisons Information Centre

131 126

Queen Elizabeth Centre (Noble Park)

(03) 9549 2777

Quitline

(24-hour telephone and information service)

137 848

The Royal Children's Hospital

(03) 9345 5522

SANDS

telephone support for loss

(03) 9899 0218

1300 072 637

SIDS & Kids Victoria

(03) 9822 9611

(24-hour crisis line)

1300 308 307

Tweddle

(Residential Family Unit, Footscray)

(03) 9689 1577

Women's Information & Referral Exchange (WIRE)

1300 134 130

