



Guidance for Health Professionals on Feeding Twins, Triplets and Higher Order Multiples



Guidance for Health Professionals on Feeding Twins, Triplets and Higher Order Multiples

This booklet has been endorsed by:
Royal College of Paediatrics and Child Health
Royal College of Nursing

Reviewed and supported by:
Royal College of Midwives

First published in 2011 by:
The Multiple Births Foundation, Hammersmith House, Level 4,
Queen Charlotte's & Chelsea Hospital, Du Cane Road, London W12 0HS
Tel: 020 3313 3519 Fax: 020 8383 3041
Email: mbf@imperial.nhs.uk Website: www.multiplebirths.org.uk

Registered Charity no: 1094546 Limited Company No: 4426289

Copyright © 2011 Multiple Births Foundation

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior written permission of the Multiple Births Foundation.

Images by Gaby Jeffs www.magnetofilms.com

Available from: The Multiple Births Foundation

ISBN: 978-1-902068-16-9

QUICK REFERENCE GUIDE.....	4-7	2.7 Formula feeding	34
1. Introduction to the guidance	8	2.8 Ongoing feeding support	36
1.1 Rationale for the guidance.....	8	2.8.1 Feeding options including different ones for co-siblings	36
1.2 How to use the guidance.....	8-9	2.8.2 Providing ongoing support.....	37
1.3 Update of the guidance	9	2.8.3 Breastfeeding in public places	38
2. Guidance on infant feeding in multiples.....	10	2.8.4 Feeding multiples when there are older siblings around.....	38
2.1 Introduction to different feeding options.....	10	2.8.5 Going back to work.....	39
2.2 Learning to breastfeed	11-12	2.9 Introduction of solids.....	39
2.2.1 Getting started	12	2.9.1 When to introduce solids	39-40
2.2.2 Simultaneous versus separate feeding.....	14	2.9.2 How to introduce solids	41
2.2.3 Positioning and attachment.....	15-17	2.10 Feeding triplets and quads.....	41-44
2.2.4 Same breast/same baby or alternating baby/breast.....	17	2.11 Meeting nutritional requirements in multiples.....	45-46
2.2.5 Feeding patterns	17-18	3. Recommendations	47
2.3 Feeding the sick or preterm baby..	18-21	3.1 Specialist training on feeding multiples for health professionals.....	47
2.4 How to avoid and resolve breastfeeding problems	22	3.2 Suggested content for breastfeeding workshops for parents	47
2.4.1 Related to the breastfeeding process.....	23-28	3.3 Auditable standards.....	47
2.4.2 Related to the mother	28-29	3.4 Research recommendations	47
2.4.3 Related to the babies.....	29-30	4. Support groups and useful organisations	48
2.5 Expressed breastmilk.....	30	5. Acknowledgements	49-50
2.5.1 Expressed breastmilk.....	30-31	6. Abbreviations.....	51
2.5.2 Reasons for expressing milk	31	7. Glossary.....	51
2.5.3 How to express and how often to express.....	32-33	8. References.....	52-55
2.5.4 Storage of expressed breastmilk.....	33		
2.6 Sterilisation and preparation of feeding equipment.....	34		

Quick Reference Guide

The guidance has been summarised by first giving some key general principles followed by the main good practice points in each section. Further information is given in the full guidance.



Key general principles

1. Babies should be **treated as individuals** when making decisions on appropriate feeding and growth patterns. Both will depend on the baby's sex, gestational age and size at birth. Co-siblings shouldn't be compared.

2. **Breast milk is the best nutrition for all babies** - whether singletons or multiples - and mothers should be supported and encouraged to provide breastmilk or breastfeed their infants.

Nevertheless, many mothers who are breastfeeding multiples may decide to introduce some formula milk at some stage, and it is important before they do so that they realise that combining breast and bottle feeding, or giving 'top ups' of formula, can affect their breastmilk supply, particularly in the first weeks after birth when lactation is being established. Mothers should also be informed that if they decide not to breastfeed, this decision may be difficult to reverse later if they change their mind.

3. Many multiple birth infants are born **slightly preterm** - between 34 and 36 weeks. These infants may appear relatively mature and are not usually treated in a NICU/SCBU. Nevertheless, they are a vulnerable group in terms of feeding:
- They are often discharged early without the care plan which would accompany a more preterm infant
 - They are often small and may require additional support to establish successful breastfeeding.
 - Each infant must be managed individually in terms of whether he/she is woken for feeds or has baby-led feeding.
 - They should be monitored carefully to ensure that they are receiving enough breast milk (see Section 2.4.3)

Learning to breastfeed (Section 2.2)

Key principles

- Mothers of multiples can produce enough milk to breastfeed multiples.
- Good antenatal preparation is important including information about how to establish and maintain breastfeeding, and sources of support and advice.
- Partners, family and friends can be a valuable source of help with feeding and non-feeding activities.
- Give mothers confidence to establish breastfeeding. In the early days after birth, mothers will need to give a lot of time in order to get breastfeeding established.
- Strategies for helping the mother with feeding include:
 - Establishing a feeding pattern so that others can help with feeding, or help with other tasks so that the mother can devote as much time as possible to feeding and resting in between feeding.
 - Help and support to achieve pain free, effective feeds.
 - Feeding the babies simultaneously.
 - Expressing breastmilk so that others can help with feeding.

Simultaneous or separate feeding (Section 2.2.2)

There is no evidence about which method is best. We suggest the following:

- Mothers may find it easier to initiate breastfeeding by feeding one baby at a time at the breast rather than feeding two babies simultaneously, until they learn how to position and attach each baby, and gain confidence.
- It might be useful to try both ways of feeding before discharge from hospital, while professional help is available.
- Eventually the mother will discover which method or combination works for her and her babies.

How to achieve effective positioning and attachment (Section 2.2.3)

- Skilled and trained professionals should provide support.
- For simultaneous breastfeeding, the mother may find extra pillows or special cushions (e.g. V-shaped or U-shaped) helpful.
- See suggested positions for simultaneous breastfeeding in Section 2.2.3.

Same breast/same baby or alternating baby/breast (Section 2.2.4)

- In general, it is preferable to alternate breasts at each feed when feeding multiples.
- Mothers and babies often find their own feeding pattern which works for them. It would only be necessary to change this if the mother has a problem or one/all of the babies are not thriving.

Feeding patterns (Section 2.2.5)

- Many mothers begin with completely baby-led feeding, but then find it helpful to try to establish some kind of pattern.
- It may take some time for the pattern to be established and mothers should not get anxious if this takes longer than they had expected.

- If the babies have very different birth weights or growth patterns then they are unlikely to have similar breastfeeding patterns and techniques.
- It is sometimes helpful to change feeding patterns for one baby at a time.

Feeding the sick or preterm baby (Section 2.3)

A high proportion of twins and almost all triplets and higher order multiples are born preterm and of low birth weight. Many are admitted to neonatal care. Every effort should be made to ensure that the babies and their mother remain in the same hospital. Some key principles specifically for multiples are:

- Encourage the parents to spend as much time as possible with the babies.
- Skin to skin contact with multiples may be done separately, sequentially or simultaneously.
- It is essential for the mother to express in order to establish a good milk supply. If expressed breastmilk is in short supply, parents may require help in deciding which baby receives it (e.g. the sickest) or whether it should be given to a different baby at each feed.
- Co-siblings are likely to start breastfeeding at different times. If only one baby can breastfeed, then that baby can be fed on one breast and then offered the second breast, after which both breasts can be pumped to provide milk for the other baby(s).
- Co-siblings are likely to have different feeding patterns. They should be assessed as individuals and not compared with their co-siblings.
- Anticipate and plan for feeding and practical routine for the mother if one baby goes home before the other.

Preventing and resolving breastfeeding problems (Section 2.4)

Problems with attachment, breasts and nipples

- These problems may take longer to be resolved due to a mother of multiples spending double time or longer breastfeeding and potentially having different sucking styles of co-siblings. See strategies for prevention and treatment in Section 2.4.1. ▶

Insufficient milk - real or perceived

- Mothers can produce enough milk to feed multiples, but this is a common reason stated for stopping breastfeeding among mothers of multiples (and singletons).
- Establish whether real or perceived insufficient milk (see Section 2.4.1 and the signs that an exclusively breastfed baby is receiving/not receiving sufficient milk) and then deal with accordingly.
- If there really is insufficient milk then you need to identify the cause and treat accordingly (Section 2.4.1).

Mother exhausted or breastfeeding takes too long

- Acknowledge how the mother is feeling.
- Discuss ways in which the mother can rest more and discuss sources of practical help available.
- Discuss what normal feeding patterns are and advise that this will change over time.

Poor growth in babies/babies losing weight

- When assessing for poor growth, note that:
 - The babies should be treated as individuals rather than being directly compared with their co-sibling(s).
 - Use the appropriate growth charts for term and preterm singletons.
 - Take into account the growth patterns and health of the babies and the size of the parents.
- Try to establish the cause of poor growth and then treat accordingly (Section 2.4.3).

Expressed breastmilk (Section 2.5)

- Expressing is common among mothers of multiples because many multiples are too preterm or sick to breastfeed directly at first.
- Expressing may also be used to optimise and increase the milk supply, when learning to breastfeed and to help relieve breastfeeding problems.
- Expressing also allows other people to feed the babies and is sometimes used as a long term feeding strategy, particularly for higher order multiples.
- Details about how to express, how often and how to store expressed breastmilk are in Section 2.5.

Sterilisation and preparation of feeding equipment (Section 2.6)

- Parents and health professionals need to be made aware of the latest guidance on the preparation of infant formula.
- Bottles, cups, etc, for multiples should be clearly labelled for each baby.

Formula feeding (Section 2.7)

Parents may decide to feed their babies formula for a variety of reasons, at a variety of times. They should be given full information and supported with their choice:

- It is recommended that babies are fed and held separately so as to maximise interaction with the carer.
- If both (all) babies wake together, it is possible to feed two babies at the same time using one of the recommended positions in Section 2.7.
- Bottle propping and use of hands-free feeding systems should be discouraged and a baby should never be left alone with a bottle.
- If more than one person is involved in feeding the babies, it is generally recommended that babies are rotated between these people, so that there is interaction and stimulation between each baby-adult pair.
- Many mothers of multiples adopt the “modified baby-led” approach. Here, whichever baby wakens first is fed first. Then the second baby is gently awakened and fed. Other feeding patterns may work better, depending on the carers and the number and age of the babies.
- Parents may have anxieties about the babies gaining enough weight, particularly if they are born preterm. On the other hand, care must be taken to avoid overfeeding, particularly if the “modified baby-led” approach is adopted. Growth charts can help monitor this.
- Feeding multiples is a time-consuming experience. The mother particularly will need help and support.
- Skin to skin contact and cuddling in formula-fed multiples should be encouraged.

Ongoing feeding support (Section 2.8)

Feeding options including different ones for co-siblings

- When considering ongoing feeding options, it is important to consider the needs of the individual babies together with those of the mother and her circumstances.
- It is likely that the co-siblings will have different feeding patterns particularly if the babies have very different sizes, weights or temperaments.
- Details about different feeding options, including how to change the feeding methods or practice, are given in Section 2.8.1.

Providing ongoing support

- Once a mother and her babies are discharged from hospital, they will continue to need support from health professionals.
- A care plan should be put in place to facilitate the transition of care from the maternity/neonatal units to the staff in the community.
- Good communication and consistent information about infant feeding are essential.
- See Section 2.8.5 for recommended practice points for those providing ongoing support to parents of multiples.

See suggestions in this section on **Breastfeeding in public places** (Section 2.8.3), **Feeding multiples when there are older siblings around** (Section 2.8.4) and **Going back to work** (Section 2.8.5).

Introducing solids (Section 2.9)

- There are no published studies on this topic so we have had to extrapolate from data on singletons.
- For multiples born at term, follow DH guidance and for multiples born prematurely follow recommendations on weaning in preterm infants (details in Section 2.9).
- Cues for when the baby is ready to start solids should be assessed separately in each co-sibling, as each baby will become ready at their own pace.

Feeding triplets and quads (Section 2.10)

Information about feeding options:

- **Support** - a mother will need a lot of support in feeding and other aspects of care. Assess how much support the mother has from those around her: partner, family, friends, paid help. HomeStart may be an option.
- **Special care and bereavement** - almost all triplets and quads are born preterm and require special care. Many have medical conditions and some will not survive, therefore parents will need appropriate support.
- **Breastfeeding** - Support the mother's goals with regard to breastfeeding and accept her decision. Inform the mother that:
 - It is possible to breastfeed triplets and quads, and to produce sufficient milk to meet the needs of the babies.
 - Breastfeeding triplets and quads, particularly once discharged from hospital, requires commitment from the mother and much support and practical help from others.
 - Some breastmilk each day, no matter how little, is still of benefit
- **Records and diaries** - most parents find it essential to write down details of every feed, at least in the early days
- **Storage** - for babies receiving expressed breastmilk or formula in bottles, a lot of bottles and fridge space may be required.

Meeting nutritional requirement in multiples (Section 2.11)

- For multiples born at or near term, refer to the current recommended intakes for term singleton pregnancies (details in Section 2.11).
- For preterm multiples, refer to the current recommended intakes for preterm singleton pregnancies (details in Section 2.11).

1. Introduction to the guidance

The multiple birth rate in the UK has been rising since the 1980s and has remained above 14 per 1000 maternities since 1997. In 2009, there were 12,595 sets of twins, 172 sets of triplets and five sets of quadruplets born in the UK. Parents expecting twins and higher order multiples will give much thought to how they plan to feed their babies. Not only are the nutritional aspects important, but there are practical implications too, since feeding will take a lot of time in the first few months.

1.1 Rationale for the guidance

There is much literature on breastfeeding in singletons, covering topics such as identifying which babies are the most likely to be breastfed, estimating the health benefits of breastfeeding and testing interventions aimed at breastfeeding promotion. The UNICEF UK Baby Friendly Initiative (BFI) has produced 10 best practice standards on breastfeeding for hospitals and a growing number of UK hospitals have been awarded, or are working towards, “Baby Friendly Initiative accreditation”. The BFI has also produced best practice standards for breastfeeding on neonatal units. There are numerous documents about breastfeeding and other aspects of infant feeding, aimed at parents and/or health professionals such as those produced by the Department of Health, the National Childbirth Trust (NCT), La Leche League, and Bliss (the premature baby society). In 2008, Best Beginnings launched the DVD “From bump to breastfeeding” which is being distributed to all pregnant women in the UK.

In contrast, the literature on infant feeding in multiples is scarce. There have been few population-based studies describing feeding practices in multiples and none have been conducted in the UK. The UK Infant Feeding Surveys which are conducted every five years only include singletons and the first-born in a set of multiples, and the survey reports do not show any results specifically for multiples. The current versions of the infant feeding documents produced by the Department of Health, the NCT, and Bliss have just a small section about feeding multiples, or make no reference to multiples at all. More detailed information specifically for

multiples is available in the form of leaflets or booklets (e.g. from the Multiple Births Foundation, Tamba, and the Association of Breastfeeding Mothers) and a book (*Gromada 2007* available at La Leche League). However, this information is not evidence based and not aimed specifically at health professionals. As a consequence of the lack of comprehensive information for health professionals, many parents of multiples report that they receive inconsistent information and advice.

In 2008, NICE produced public health guidance on maternal and child nutrition, which included several recommendations for the promotion of breastfeeding (*NICE 2008*). The recommendations included training for health professionals and ensuring that there is a written, audited and well-publicised breastfeeding policy. The NICE guideline did not specifically address multiples. Ours is the first evidence-based guidance for health professionals and peer support workers which specifically addresses infant feeding in multiples.

Analysis of the 2005 Infant Feeding Survey, which was conducted as part of the development of this guidance, showed that breastfeeding rates were lower in twins than in singletons (see Section 2.2). Importantly, most mothers of twins who stopped breastfeeding said that they would have liked to have breastfed for longer (see Section 2.4). Support from trained professionals is an essential component of increasing the breastfeeding rates in multiples.

1.2 How to use the guidance

This guidance is about aspects of infant feeding which are specific to multiples. Where there is information already available on infant feeding which is relevant for multiples, we have referred to these documents and not covered them in detail.

The topics covered in this guidance include feeding with breastmilk, feeding the sick or preterm baby, expressing milk, sterilisation of equipment, formula feeding and starting solids. Triplets and higher order multiples are covered within these sections and also in a separate section. While breastfeeding has been covered extensively in this guidance, we recognise that not all multiples will be exclusively breastfed and have included

information about all aspects of feeding. We recognise that the feeding needs of multiples will vary at different stages and ages, so the guidance should be used flexibly. For example, the section on expressed milk is relevant for feeding the sick or preterm baby, and for the mother who is expressing for other reasons.

The guidance has several parts which are aimed at health professionals:

- A comprehensive guidance document.
- Appendices to the guidance which describe the systematic review and evidence tables.
- A quick reference guide which summarises the guidance.

In addition, the following is aimed at parents:

- A booklet based on the guidance written specifically for parents.

We hope that the guidance will be used by health professionals to give parents of multiples full information about infant feeding and to help support them with their choices. The guidance was developed by a Guideline Development Group (GDG) (details in Section 5). A systematic review of the literature on infant feeding in multiples was conducted in order to identify the evidence base for the guidance. Details of the systematic review may be found in the Appendices. For most of the guideline topics, the quality of evidence was not good - most of the studies were small, descriptive studies and case reports, and occasionally larger descriptive studies. Hence, the guidance recommendations have been written as a summary of the options available, with some recommended good practice points based on the clinical experience of the GDG (grade E, see Table 1 below) where appropriate.

Table 1: Classification of evidence levels

Classification of evidence levels	Grades of recommendation
1++ High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias.	A At least one meta-analysis, systematic review, or RCT rated as 1++, and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results.
1+ Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias.	B A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 1++ or 1+.
1- Meta-analyses, systematic reviews, or RCTs with a high risk of bias.	C A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++.
2++ High quality systematic reviews of case control or cohort or studies. High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal.	D Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+.
2+ Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal.	E Recommended best practice based on the clinical experience of the guideline development group.
2- Case control, cohort or cross-sectional studies with a high risk of confounding or bias and a significant risk that the relationship is not causal.	
3 Non-analytic studies, e.g. case reports, case series.	
4 Expert opinion.	

1.3 Update of the guidance

The guidance was issued in January 2011 and is due to be updated in 2013.

2. Guidance on infant feeding in multiples

2.1 Introduction to different feeding options

Breastmilk is recommended for all babies, including multiples. One of the important differences between breastmilk and formula is that breastmilk possesses anti-infective properties and living cells which protect babies from infection. For preterm infants, with immature immune and gut function, this protection is particularly valuable. Breastmilk is better absorbed than formula milk, which in turn may lead to earlier tolerance of full milk feeding (Jones 2005).

A review of the evidence of the effects of breastfeeding on infant and maternal health outcomes in developed countries concluded that breastfeeding is associated with a reduced risk of many diseases in both babies and mothers (Ip 2007). Since the review was published, a large UK study found that breastfeeding was associated with a lower risk of hospitalisation for infection: 53% of hospitalisations for diarrhoea and 27% of hospitalisations for lower respiratory tract infection could have been prevented each month by exclusive breastfeeding (Quigley 2007a).

For babies who cannot directly breastfeed, expressed breastmilk may be given to them via a tube, bottle or cup. There is currently variation between neonatal units in their use of bottles and cups, although achievement of Baby Friendly Accreditation currently requires units to avoid the routine use of bottles. Donor breast milk is an alternative source of breastmilk when milk from the baby's mother is unavailable or in short supply. This is given to the baby via a tube, bottle or cup. Preterm babies fed donor breastmilk have a lower risk of necrotising enterocolitis than those fed formula milk (Quigley 2007b), in the same way as with the mother's own expressed milk.

While breastfeeding is accepted as the gold standard, many multiples in the UK will receive formula milk at some point. Some parents of multiples will elect to feed their babies formula milk from very early on and others will choose to supplement breastmilk with formula milk at some point.

All the different feeding options are summarised below together with some points to bear in mind when discussing the different feeding options.

Points to bear in mind when discussing the different feeding options with the parents:

When considering the different feeding options, the condition of both **the mother** and **the babies** should be assessed. Note that these needs may change over time, either for better (for example, as very preterm babies get stronger, or as the mother's health improves after the birth), or for worse (for example, if the baby's health deteriorates, or if the mother becomes exhausted, or the amount of support she has changes). Therefore, it may be appropriate to review feeding options at intervals.

Different feeding options:

- **Breastfeeding** - many mothers successfully breastfeed multiples. This is the optimal form of nutrition for babies and has many health benefits for both mother and babies. Detailed practical information about breastfeeding multiples is given in Section 2.2, and on nutritional requirements is given in Section 2.1.1.
- **Mother's own expressed breastmilk (EBM)** - this allows babies who cannot (yet) directly breastfeed to receive breastmilk via a tube, bottle or cup. It also enables babies to be given breastmilk by other people, for example, if the mother is ill, at work, or (breast) feeding another baby. As mother's own EBM may not meet all the nutritional requirements of infants born prematurely, some neonatal units have a policy of adding a breastmilk fortifier, especially for very preterm babies (see Section 2.11). Detailed information about expressing is given in Section 2.5.
- **Donor breastmilk** - this is an alternative source of breastmilk when milk from the infant's mother is unavailable or in short supply. Breastmilk from carefully screened donors is pasteurised, frozen and defrosted when needed, and given to the baby via a tube, bottle or cup. More detailed information is given in Section 2.5.



- **Formula feeding** - practical information on formula feeding in multiples is given in Section 2.7, and on nutritional requirements is given in Section 2.1.1.
- **Mixed feeding** - i.e. different combinations of the above. Any breastmilk received is better than none at all. Practical information on mixed feeding may be found in the sections on breastfeeding, expressing and formula feeding. Mixed feeding is also briefly covered in Section 2.8.1.

sources of support and advice should be included. Consistent professional support is vital. Partners, family and friends are a valuable source of help.

One of the key issues in breastfeeding multiples is giving mothers the confidence to establish breastfeeding. Relactation is possible although it may be difficult to achieve. In the early days after birth, mothers will need to give a lot of time in order to feel confident about breastfeeding. If the babies are well and mature enough to feed, it is best if feeding can be baby-led at least in the first few weeks - feeding the baby who wakes first, and then waking the second one straight afterwards so that feed times are kept close together. As the milk supply increases the length of time between feeds should get longer and an emerging pattern develop. Although only the mother can actually breastfeed her babies, there are ways for others to support the mother in doing this. Strategies include feeding the twins (or two of the multiples) simultaneously, expressing breastmilk, and establishing a feeding pattern, or help with other tasks so that the mother can devote as much time as possible to feeding and resting in between feeding. Other issues to be considered are whether to change each baby from one breast to the other at alternate feeds rather than let each baby feed exclusively on one side, and the use of feeding routines compared with completely "baby-led" feeding. These and other strategies are described later in this section. ▶

2.2 Learning to breastfeed

Key issues

Mothers of multiples can produce enough milk to breastfeed twins, triplets and higher order multiples (see Sections 2.4.1 and 2.10). Many women who breastfeed multiples have a positive experience of breastfeeding and particularly enjoy the time they spend with each baby, either together or individually. They also enjoy the "rest time" associated with breastfeeding. For some mothers, it is not always the experience they had hoped it would be and they need support and skilled help to achieve their goals.

Good antenatal preparation is important. Information about how to establish breastfeeding, teaching the practical aspects of breastfeeding, the

Can multiples breastfeed successfully?

There is strong evidence from many studies that the rates and duration of breastfeeding are lower in multiples than in singletons, although the same studies show that a significant proportion of multiples receive some breastmilk, and some of these are breastfed for several months. The most recent UK data show that about a quarter of twins are receiving breastmilk at 3 months compared with about 40% of singletons (see Summary of evidence on facing page).

Are there good breastfeeding techniques for multiples?

There have been few high quality studies on the issues specific to breastfeeding in multiples. Some studies are difficult to interpret because they do not distinguish between breastfeeding directly from the breast and receiving expressed breastmilk. The little available evidence suggests that simultaneous feeding seems to work well for some multiples but not for others, and that for some, a combination of simultaneous and separate feeding works. Others start off doing one and change to the other due to the changing needs of the mother or babies, for example, as the babies get bigger. For those who choose simultaneous feeding, different positions suit different mothers and babies (see Summary of evidence below). There is no high quality evidence to recommend one particular technique of breastfeeding in multiples over another technique. What follows is a summary of the different options available, their potential advantages and disadvantages, and some recommended practice points.

Is one breastfeeding technique for multiples better than the rest?

Summary of evidence [level 3]

For simultaneous versus separate feeding:

- In a Swedish study of 13 sets of preterm twins, 11 sets were being breastfed at discharge and 6 of these sets were being exclusively breastfed (Nyquist 2002). At discharge, 8 mothers preferred simultaneous feeding and 3 preferred separate feeding. 7 mothers used the “underarm” position (referred to as the “football” position), 2 used a combination (1 in the underarm, 1 in the cradle), 1 had no preference and 1 changed positions before discharge.
- In a UK case study of one set of twins, the underarm position (referred to in the paper as the “rugby ball” position) worked well, although at 1-3 months approximately 40% of feeds were separate (Emsley 1994).

2.2.1 Getting started

The following good practice points help in the establishment of breastfeeding in singletons (*Department of Health “Off to the best start”*), and these apply also to healthy multiples.

Recommended practice points [grade E]:

- Early skin to skin contact as soon after delivery as possible is recommended. Skin to skin contact with multiples may be done separately, sequentially or simultaneously. This is a good time to begin breastfeeds.
- Early and frequent breastfeeding will establish a good milk supply and ensure that the babies receive colostrum. If the babies cannot breastfeed directly then early breast stimulation is recommended, to show the mother how to express (see Section 2.5).
- Support from skilled and trained professionals is extremely important for the establishment of a good milk supply and learning to breastfeed. This is particularly important for multiples on the postnatal ward, where breastfeeding support may be limited, and for whom the establishment of breastfeeding may be more difficult than for healthy term singletons.

How many multiples are breastfed?

Summary of evidence [level 2+]

Evidence from the systematic review

Of the 20 studies in our systematic review (Appendix 2.4) which compared breastfeeding rates in multiples and singletons:

- Between 12% and 64% of multiples were being breastfed at 3-4 months (12 studies)
- Between 1% and 18% were being exclusively breastfed (EBF) at 3-4 months (9 studies).

Evidence from recent UK studies

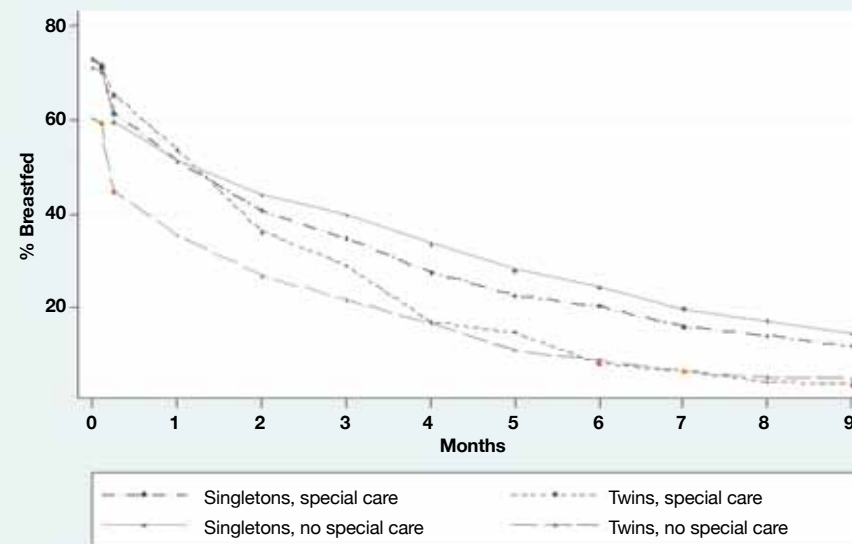
In the 2005 Infant Feeding Survey:

- For babies who had special care, 20% of twins and 33% of singletons were being breastfed at 3 months.
- For babies who did not have special care, 19% of twins and 40% of singletons were being breastfed at 3 months.
- For babies who had special care, 5% of twins and 9% of singletons were being EBF at 3 months.
- For babies who did not have special care, 4% of twins and 15% of singletons were EBF at 3 months.

In the Millennium Cohort Study (see Figure below):

- For babies who had special care, 29% of twins and 35% of singletons were being breastfed at 3 months.
- For babies who did not have special care, 22% of twins and 40% of singletons were being breastfed at 3 months.
- For babies who had special care, 4% of twins and 21% of singletons were being EBF at 3 months.
- For babies who did not have special care, 12% of twins and 28% of singletons were being EBF at 3 months.

Duration of breastfeeding in singletons and twins



Source: Millennium Cohort Study

2.2.2 Simultaneous versus separate feeding

Mothers of twins have the option of feeding their infants simultaneously or separately. Below are some of the potential advantages and disadvantages of each approach, together with some recommended practice points.

Some of the key differences between simultaneous and separate feeding

Note that these points may change over time.

Simultaneous feeding:

- Takes time for the mother to gain confidence in feeding two together.
- Once simultaneous feeding is established, it saves time and there is less disruption in the night.
- Allows the more vigorous baby to stimulate the milk ejection reflex in the other breast for the less vigorous baby.

Separate feeding:

- It is generally easier, since the mother has both hands free to attach and position the baby, and once attached, the mother has a spare hand to rock the other baby, cuddle another child or hold a drink.
- Allows the mother to give individualised attention to each baby separately; this is particularly important in the early days, when mothers often feel they have very little one-to-one time with each baby.
- Easy to discreetly breastfeed one baby.

Simultaneous or separate feeding - recommended practice points [grade E]:

There is no evidence about which method is best. The following options should be discussed with the mother so that she can explore what options work best for her and her babies.

In the first few days, try both:

- Mothers may prefer to initiate breastfeeding by feeding one baby at a time at the breast rather than feeding two babies simultaneously. This enables the mother to get to know each baby, assess the effectiveness of infant attachment and suckling, gain confidence, and make any necessary modifications. Also, in the first few days, mothers of multiples often feel overwhelmed with how they will cope with feeding two babies at the same time when they are still recovering from the delivery and learning to breastfeed.
- The mother may find it helpful to try both ways of feeding her babies before discharge from hospital, while professional help is available.

In time the mother will discover which method works for her.

Some mothers do both:

- Some mothers may prefer to feed the babies separately for most feeds, and will reserve simultaneous feeding for special circumstances e.g. two babies crying at the same time, or the mother wants to feed in a shorter time such as at night time.

Why some mothers prefer to feed the babies separately for all or most feeds:

- Mothers can ensure effective attachment and positioning, feel more comfortable and less conspicuous, and can devote attention to one infant at a time.
- When feeding simultaneously, one or both infants may not cope with a forceful milk ejection reflex or may not settle into the feed.
- Women may feel trapped feeding two at once, awkward, too conspicuous and some dislike the sensation of two infants suckling simultaneously, but differently.

Why some mothers may prefer to feed simultaneously for all or most feeds:

- Their babies are more skilled at latching and suckling and therefore simultaneous feeding is relatively easy.
- Their babies respond positively to a co-sibling feeding at the same time (e.g. copes with the milk ejection reflex, is not distracted by the other multiple).
- The saving of time is important.
- The mother is more confident and comfortable with simultaneous feeding.

2.2.3 Positioning and attachment

Almost all breastfeeding mothers need practical help, support and encouragement at some stage, particularly with positioning and attachment.

How to achieve effective positioning and attachment [grade E]

- Help from skilled and trained professionals or support groups on positioning and attachment should be provided. See list of helpful organisations in Section 7.
- Even when a mother is confident with positioning and attachment, she may still need someone to help with feeds at least in the early days e.g. to help position the second baby when simultaneously feeding, or to look after co-sibling(s) when the babies are fed separately.
- Identify a comfortable chair or sofa, and put the phone, a drink, etc. within easy reach.
- The mother may need pillows to support her back when she starts breastfeeding. She might find it helpful to position extra pillows on her knees to take the weight of the babies. Try using different cushions to help with positioning and support. Some mothers find the V-shaped or U-shaped cushions helpful (available at most large department stores) while others prefer to use additional ordinary pillows. Care should be taken that pillows and cushions don't bring the baby up too high.
- Some mothers find it easier to feed their babies when lying down, particularly if the mother is tired, ill, or has had a caesarean section. Details about babies' innate abilities to feed and 'laid back breastfeeding' where the mother is lying back on pillows may be found in *Colson 2005*.

For those mothers who are trying simultaneous feeding, there are several commonly used positions which are described below.

Some suggested positions for simultaneous breastfeeding

There are no rules on how to do this. We suggest that the mother tries different positions and does whatever is comfortable for her and her babies. Different positions may suit her and her babies at different times. She might find the following practical tips helpful.

- It is often easier to start with the baby who is experiencing difficulties in attaching effectively (as the mother has two hands free and can devote all her attention to this baby) followed by the baby who is more skilled at feeding.
- In other situations, the avid feeder who attaches easily may be started first in order to establish the letdown for the baby having difficulty.
- Try feeding with different cushions and in different places - women have different preferences.
- Changing positions may be important to prevent or assist in healing sore nipples. It is also useful to assist milk drainage particularly with blocked ducts.

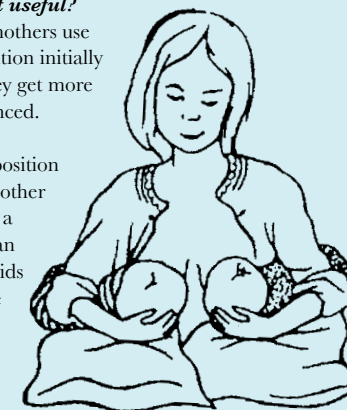
Double underarm hold (Figure 1)

What is it?

A baby's neck and shoulders are supported in each of the mother's hands (or on a pillow) with a baby's body lying under each of the mother's arms. Avoid fingers and hand pushing the baby's head as this can prevent the extension needed for effective attachment. This hold is sometimes referred to as the "double football" or "double rugby ball".

When is it useful?

- Many mothers use this position initially until they get more experienced.
- Useful position if the mother has had a caesarean as it avoids pressure on the incision area.



Parallel hold (Figure 2)

What is it?

In this position, both babies' bodies are angled in the same direction. Baby A is cradle-held with the baby's legs behind and supporting Baby B's head.

When is it useful?

- The mother's arms can rest on the pillows in front, comfortably encircling both babies.



Double cradle or criss-cross (Figure 3)

What is it?

In this position, each baby is held like a singleton in the cradle position. The two babies cross over the mother's abdomen.

When is it useful?

- It provides an alternative to assist in the prevention or treatment of sore nipples.
- This position may be more difficult for the babies to maintain, and tends to be used when the mother is more experienced and the babies have better head control.

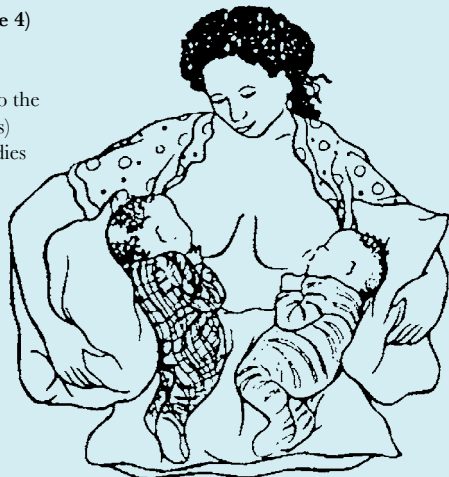
V-shaped hold (Figure 4)

What is it?

This position is similar to the double-cradle (criss-cross) hold, but the babies' bodies are pointed downwards, parallel to the mother's sides. The mother is in a more reclining position.

When is it useful?

- Once the mother is adept in this position, she may rest more comfortably.



Cradle/underarm i.e. combination of cradle and underarm

What is it?

Baby A is held in the cradle position (across the mother's chest) and Baby B is held in the underarm position.

When is it useful?

- Allows alternate positioning which may be important to prevent or assist in healing sore nipples.

Other positions

- Mothers might have their own variation of one of the suggested positions.
- Mothers might find that different positions work well at different times, for example, one might work well in the early days and another position might work well once breastfeeding is established.
- Some mothers prefer to feed their babies while lying down, for example, lying on her side and feeding one baby while snoozing or cuddling the other. Some mothers find they can feed two babies simultaneously while lying down.

2.2.4 Same breast/same baby or alternating baby/breast

Mothers and babies often find their own feeding pattern which works for them. It would only be necessary to change this if the mother has a problem or one/all of the babies are not thriving.

Recommended practice points [grade E]:

- In general, it is preferable to alternate breasts when feeding multiples as each breast may have a different production and storage capacity:
 - This ensures each breast receives equal stimulation from all babies.
 - It helps prevent sore nipples and/or allows additional healing time for sore nipples.
 - The mother might find it helpful to pin a small safety pin to her bra to the side a particular baby fed from last, in case she forgets.
- Some mothers assign each baby the same breast at each feed:
 - It is not uncommon for a baby to develop a preference for one side (or breast or nipple), for example, because of the shape of the nipple, the rate of flow of milk, or the sound of the mother's heart beat.
 - By using the same breast for the same baby, the mother can more easily remember who fed for how long at each feed. However, an alternative would be to record what side each baby fed from at each feed.

2.2.5 Feeding patterns

In order to establish a good milk supply, breast stimulation needs to be frequent. Hence, breastfeeding needs to be unrestricted and/or expression needs to be frequent. This is particularly important in the early days. Skin to skin contact can also help establish a good milk supply (see Section 2.2.1). To some extent, the type of feeding pattern which is adopted is determined by whether the babies are being exclusively breastfed, whether they are receiving any expressed breastmilk or formula milk, and whether the breastfeeding is simultaneous or separate. The type of feeding pattern adopted in the early days may change over time. Here are some different options to consider:

Different types of feeding patterns for healthy, term babies:

Individual feeding, completely baby-led

In the first days after birth, mothers often find it easier to feed each baby individually according to each baby's feeding cues, until both babies are feeding well and she feels confident in handling both babies at the breast together. This also has the advantage of allowing the mother to give each baby her undivided attention during feedings, although this only works if the other baby(s) do not need her attention. A baby may feed more effectively if exhibiting feeding cues rather than after being wakened to feed. The mother also has the advantage of having both hands free to position the baby. However, it is usually extremely time-consuming and tiring to exclusively breastfeed two or more babies separately according to each baby's feeding cues, since the interval between feedings may be very short. This approach may work for babies who have short feeds.

Individual feeding, "modified baby-led"

Many mothers of multiples adopt this approach. Here, whichever baby wakens (or cries to be fed) first, is fed first. Then the second baby is gently awakened and fed individually, so that the mother has a reasonable interval until the next feed. The main drawback to this approach is that the awakened baby may be difficult to arouse and may not feed so well, although most babies usually get into this pattern fairly quickly.

Simultaneous feeding, “modified baby-led”

For mothers who are feeding the babies simultaneously, the “modified baby-led” approach can be adopted. She will still have to wake the second baby to achieve this.

Emerging feeding patterns

Most mothers of multiples find it helpful to establish some kind of pattern as soon as possible. This may include a specific type of feeding pattern (such as “modified baby-led” feeding) or other feeding task (such as expressing milk after a particular feed or at a certain time), or getting help from others (e.g. someone else feeding or occupying one baby while the mother feeds the other). It may take some time to establish a pattern and mothers should not get anxious if this takes longer than they had expected.

Different feeding patterns for different babies

- If the babies have very different birth weights or growth patterns then they are unlikely to have similar breastfeeding patterns and techniques.
- It is sometimes helpful to change feeding patterns for one baby at a time. For example, if the babies currently have mixed feeding (some breastmilk and some formula) and the mother is aiming for exclusive breastfeeding it might be worth considering getting one baby exclusive breastfed while leaving the other baby(s) having mixed feeds, particularly if the other baby(s) have feeding or attachment difficulties. Feeding one baby exclusively will increase the milk supply. Once this baby is exclusively breastfeeding then the supplementing of the other baby(s) can often be reduced.

2.3 Feeding the sick or preterm baby

Key issues

Because a high proportion of twins (and almost all triplets and higher order multiples) are born preterm and of low birth weight, many are admitted to neonatal care. This can be a particularly stressful time for parents. Many babies will be too premature or sick to breastfeed directly. If this is the case, it is preferable to give them expressed breastmilk (see Section 2.5). It is particularly important that premature or sick babies receive breastmilk rather than formula, since it helps protect them from necrotising enterocolitis (NEC) and infection, and it promotes brain growth and development.

For many aspects of feeding sick or preterm babies, there is currently little evidence as to what works best in establishing milk feeding and preventing serious complications. A systematic review of breastfeeding in neonatal units found that interventions such as Kangaroo skin-to-skin contact, regular expressing using an effective breast pump, peer support, Baby Friendly accreditation of the associated maternity unit and multidisciplinary staff training were effective in increasing breastfeeding rates (Renfrew 2009). Most of the evidence relates to clinically stable infants. There is little evidence on more clinical interventions and on the effect of any interventions on health and development outcomes.

There is currently variation in clinical practice between and even within neonatal units. The process of establishing milk feeding is often not straightforward, particularly for babies who develop feed intolerance or other problems such as NEC or infection. Hence, feeding protocols may be adapted to suit the needs of a particular baby. For example, once milk feeding starts, the amount of milk given will be increased gradually, but it is not unusual for complications to arise and for feeding to be temporarily decreased or even stopped, before being gradually increased again. Babies who are particularly growth restricted often demonstrate intolerance of milk feeds and are at an increased risk of NEC. The use of evidence-based practical guidelines will help standardise practice and allow professionals to adapt these guidelines according to the clinical condition of the infant (Kuzma-O'Reilly 2003, Patole 2005).

What are the key issues specifically for multiples?

All of the above problems could apply to singletons and multiples. However, there are additional issues for parents of multiples. First, it is even more stressful for the parents to have more than one baby with these complications. Second, the co-siblings may be at different stages of establishing feeding, or have different complications. The parents may even be grieving the death of a co-sibling (s) at the same time as worrying about another sick baby. Anxiety about sick babies can sometimes affect milk supply in mothers who are expressing milk. Finally, the co-siblings may be in different places, for example if one is in hospital and the other is at home, and sometimes they are in different hospitals. Every effort should be made to keep the babies in the same hospital.

Can sick or preterm multiples breastfeed successfully?

There is evidence from different settings that many sick or preterm multiples receive breastmilk, sometimes for prolonged periods. The most recent UK data show that about a quarter of sick or preterm twins are receiving breastmilk at 3 months (see Summary of evidence). When interpreting the results from these studies, it should be noted that they varied between settings and also between the type of babies included, for example, their

inclusion criteria was based on varying cut-offs for gestational age and/or birth weight. Most studies focussed on “breastfeeding rates” without giving detail on the feeding process and any complications such as how many babies were tube fed, whether they had skin to skin contact, the use of non-nutritive sucking, cups, etc, and how long the babies received expressed breastmilk rather than being breastfed directly. Hence, it is not possible to use these figures to identify whether breastfeeding is more likely in a particular group of sick or preterm multiples, or whether it is associated with a particular practice.

How many sick or preterm multiples are breastfed?*

Summary of evidence [2+]

Evidence from the systematic review

Of the 9 studies in our systematic review (Appendix 2.5) which measured breastmilk feeding rates in sick or preterm multiples:

- Between 40% and 85% of multiples were receiving breastmilk at 1 week or discharge (2 studies).
- Between 11% and 46% of multiples were receiving exclusive breastmilk at 1 week or discharge (3 studies).
- Between 12% and 64% of multiples were receiving breastmilk at 3-4 months (6 studies).
- Between 4% and 18% of multiples were receiving exclusive breastmilk at 3-4 months (4 studies).

Evidence from recent UK studies

For babies who had special care in the 2005 Infant Feeding Survey:

- 20% of twins were receiving breastmilk at 3 months.
- 5% of twins were receiving exclusive breastmilk at 3 months.

For babies who had special care in the Millennium Cohort Study:

- 29% of twins were receiving breastmilk at 3 months.
- 4% of twins were receiving exclusive breastmilk at 3 months.

**Note that here “breastfed” means received breastmilk. Most studies do not distinguish between direct breastfeeding and receiving breastmilk via a bottle, cup or tube. None of the studies mentioned whether the babies received donor breastmilk. Hence these figures are likely to reflect mostly mother’s own breastmilk.*

Recommended practice points [grade E]:

Overleaf are some of the recommended practice points for issues that are specific to preterm or sick multiples. Further information on nutritional requirements of preterm multiples is given in Section 2.11. General information on feeding sick and preterm babies may be found in the Bliss booklet (Jones 2009). The UNICEF UK Baby Friendly Initiative has produced best standards for neonatal units (for details see www.babyfriendly.org.uk). These give guidance on what constitutes best practice for breastfeeding when babies are preterm or ill and separated from their mothers.

Key issues which may arise in feeding preterm and sick multiples	Recommended practice points [grade E]
<p>Parental stress and anxiety</p> <ul style="list-style-type: none"> It is extremely stressful to have one or more baby in neonatal intensive care. Intense stress about sick co-siblings or grieving about a deceased co-sibling may delay or diminish milk supply. 	<ul style="list-style-type: none"> Support the mother and family in acknowledging the possible effect of stress on lactation and breastfeeding, and initiate appropriate strategies to minimise their effects e.g. help the mother with any practical tasks, encourage relaxation techniques, massage. Encourage the parents to spend as much time as possible with the babies. Mothers who have babies in the neonatal units should be encouraged to contact support groups (see Section 4).
<p>Separation</p> <ul style="list-style-type: none"> Sometimes, the mother has one healthy baby on the postnatal ward or at home, and one sick baby on the neonatal ward. It is not uncommon for twins and higher order multiples to end up in different hospitals. Breastmilk feeding is more challenging when the mother is separated from the babies. 	<ul style="list-style-type: none"> Placement of babies in separate units should be avoided whenever possible. If it does happen then they should be reunited as soon as possible. If the mother is on the postnatal ward and baby(s) are in neonatal unit then good communication between staff in these two units is essential e.g. the mother needs to be encouraged to express milk as soon as possible after delivery. Her meals and medicines should be kept for her as feed times may not fit with ward routine. Encourage the parents to spend as much time as possible with the babies.
<p>Expressing</p> <ul style="list-style-type: none"> If breastfeeding is not possible, it is essential to express in order to establish a good milk supply. 	<ul style="list-style-type: none"> For further details on expressing, see Section 2.5. It is essential that mothers have the correct pumping equipment and are given early instruction on how and when to use it. Consider the use of parents' facilities such as a discreet sitting room, expressing room and bedrooms.
<p>Skin to skin contact</p> <ul style="list-style-type: none"> This involves direct skin to skin contact of the baby's front with the mother's chest. It may be done with both term and preterm babies. The benefits include fostering earlier initiation of breastfeeding, facilitating milk production, decreasing infant crying, increasing breastfeeding duration and improved mother-infant attachment (Moore 2007). 	<ul style="list-style-type: none"> Skin to skin contact with multiples may be done separately, sequentially or simultaneously. Skin to skin contact should be facilitated for extended periods of time if the parents wish. Skin to skin contact may be done with fathers and other family members (although not for the breastfeeding-related advantages).

Key issues which may arise in feeding preterm and sick multiples	Recommended practice points [grade E]
<p>Initial enteral feeding may vary in a number of ways depending on the neonatal unit and the individual baby's condition:</p> <ul style="list-style-type: none"> Use of TPN (total parenteral nutrition). Delaying milk feeding. Rate of progression of milk feeding. Use of fortifiers in expressed breastmilk. Use of donor breastmilk. Use of formula. 	<ul style="list-style-type: none"> Co-siblings may have different feeding patterns. They should be assessed as individuals and not compared with their co-siblings. If expressed breastmilk is in short supply, parents may require help in deciding which baby receives it (e.g. the sickest) or whether it should be given to a different baby at each feed or divided equally with a little expressed breastmilk added to each formula feed. The same issue applies if donor breastmilk is being used.
<p>Progress towards direct breastfeeding</p> <ul style="list-style-type: none"> For premature babies, there is often a gradual steady progress towards direct breastfeeding. This should involve trained and skilled professionals and peer support groups using the techniques that they are most comfortable with. These may include cups and/or bottles; non-nutritive sucking; and nipple shields. It should be noted that achievement of Baby Friendly accreditation currently requires units to avoid the routine use of bottles. Mothers should be supported to move "off" these and onto direct breastfeeding. For further details, including the available evidence, see the Bliss booklet <i>Breastfeeding your premature baby</i>? 	<ul style="list-style-type: none"> Co-siblings may have different feeding patterns and may start breastfeeding at different times. If only one baby can breastfeed, then that baby can be fed on one side before offering the second breast, after which both breasts can be pumped to provide milk for the other baby(s).
<p>Discharge planning</p> <ul style="list-style-type: none"> Sometimes one baby may be ready to go home before the other. 	<ul style="list-style-type: none"> Anticipate and plan for feeding and the practical routine for the mother if one baby goes home before the other. Infection control will need to be discussed with the unit if the sibling is to return to visit with the mother.

2.4 Preventing and resolving breastfeeding problems

Breastfeeding is a skill that needs to be learned by mothers and babies. For all breastfeeding mothers, especially those with twins and triplets, establishing feeding and maintaining confidence in their ability to continue is a fundamental requirement. In the absence of a strong, knowledgeable breastfeeding culture, mothers need help to achieve this from skilled and trained professionals. If problems arise it is important to establish the cause and deal with it appropriately, without undermining the mother's confidence in her ability to breastfeed.

There were two studies of the reasons for breastfeeding cessation in multiples which were identified in our review. In the 2005 Infant Feeding Survey, reasons for breastfeeding cessation at 0-2 weeks and 2-6 weeks after birth were described in singletons and twins. In a US survey of 67 mothers of twins, reasons for breastfeeding cessation at 0-9 weeks and 9-28 weeks were described. In both surveys, more than one reason could be given by the mothers. The results from both surveys are summarised below and are referred to throughout this section.

Reasons for stopping breastfeeding in mothers of twins in the 2005 Infant Feeding Survey		
	Stopped at 0-2 weeks (n=22)	Stopped at 2-6 weeks (n=26)
Insufficient milk	6 (23%)	12 (55%)
Baby behaviour		
Baby rejected breast	4 (15%)	1 (5%)
Illness/Medication:	6 (23%)	5 (23%)
Caesarean	0 (0%)	1 (5%)
Mother was ill	3 (12%)	2 (9%)
Painful breast/nipples	2 (8%)	1 (5%)
Problem(s) expressing milk	1 (4%)	1 (5%)
Baby's health:	6 (23%)	5 (23%)
Baby was premature	2 (8%)	0 (0%)
Baby losing weight	0 (0%)	0 (0%)
Baby was ill	4 (15%)	5 (23%)
Twins / impossible	10 (38%)	10 (45%)
Time/burden:	7 (27%)	12 (55%)
Too stressful/causing distress	1 (4%)	0 (0%)
BF took too long/too tiring	5 (19%)	9 (41%)
Could not be fed by others	1 (4%)	0 (0%)
Found breastfeeding difficult	0 (0%)	3 (14%)
Domestic reasons	5 (19%)	5 (23%)

Reasons for stopping breastfeeding in mothers of twins in the US (Damato 2005b)		
	Stopped at 0-9 weeks (n=30)	Stopped at 9-28 weeks (n=37)
Related to BF process		
Inadequate milk	12 (40%)	8 (22%)
Breast/nipple problems	3 (10%)	1 (3%)
Lack of knowledge	1 (3%)	0 (0%)
Related to mother:		
Time/burden	9 (30%)	12 (32%)
Burden of pumping	3 (10%)	5 (14%)
Older siblings	4 (13%)	3 (8%)
Work/employment	2 (7%)	11 (30%)
Illness/medication	5 (17%)	1 (3%)
Energy/fatigue	5 (17%)	3 (8%)
Emotions/attitudes	0 (0%)	5 (14%)
Related to babies:		
Baby's health	5 (17%)	2 (5%)
Baby behaviours	7 (23%)	6 (16%)
Growth & development	0 (0%)	3 (8%)
Other	2 (7%)	3 (8%)

In the 2005 *Infant Feeding Survey*, one of the most common reasons for stopping breastfeeding among mothers of twins was "twins/impossible" (mentioned by 38% of mothers who stopped within the first two weeks and by 45% who stopped at 2-6 weeks). Most mothers of twins who stopped breastfeeding said that they would have liked to have breastfed for longer: 82% (41/50) of those who stopped breastfeeding during Stage 1 of the survey (4-10 weeks postpartum) and 80% (48/60) of those who stopped during Stage 2 (4-6 months postpartum). With more support from trained professionals, it is possible that some of these mothers would have breastfed for longer.

This section summarises the potential problems that may arise when breastfeeding multiples, together with practical information on how to prevent and resolve them. The problems have been grouped according to whether they are related to the breastfeeding process (2.4.1), related to the mother (2.4.2) or related to the babies (2.4.3).

2.4.1 Related to the breastfeeding process

Some of the more common problems which may arise when breastfeeding include: ineffective attachment and positioning; sore breasts/nipples; engorgement; mastitis; and insufficient (or perceived insufficient) milk.

Problems with attachment, breasts and nipples

Our systematic review identified no data on the frequency of these problems and whether they are more or less common in mothers of multiples compared with mothers of singletons. In the two surveys which studied reasons for stopping breastfeeding, problems with attachment, breasts and nipples were not common reasons for stopping breastfeeding (see Summary of evidence below). Many breastfeeding problems in singletons are due to poor attachment and positioning. While poor attachment and positioning is probably not more common in mothers of multiples compared with mothers of singletons, it may take longer for the problem (e.g. sore nipples, blocked ducts) to be resolved due to spending double time or longer on the breasts and potentially having different sucking styles of co-siblings. This may have a greater effect due to the frequency of feeds and the increased milk supply.

Do women who are breastfeeding multiples stop breastfeeding because of problems related to attachment, breasts and nipples?

Summary of evidence [level 2-]

Evidence from the 2005 Infant Feeding Survey & the US study

- None of the women specifically mentioned problems with attachment/positioning, engorgement or mastitis as a reason for breastfeeding cessation.
- "Painful breasts/nipples" and "breast/nipple problems" were mentioned in both surveys, but were not a common reason for stopping breastfeeding: mentioned by 3-10% of mothers depending on the survey and the time point.

Overleaf are some suggested practice points for resolving feeding problems which arise due to problems related to the breastfeeding process.

Potential problems related to attachment, breasts and nipples		
Problem	Prevention	Recommended treatment/solution [grade E]
Problems with attachment/positioning	<ul style="list-style-type: none"> Effective positioning and attachment (see 2.2.3) 	<ul style="list-style-type: none"> Provide help on positioning & attachment. The mother may want to try different positions (see 2.2.3) or different ways of simultaneous feeding.
Sore breasts/nipples	<ul style="list-style-type: none"> Effective positioning and attachment (see 2.2.3) Effective expressing (see 2.5). 	<ul style="list-style-type: none"> Check babies' positioning and attachment (see above). It may help to express a little to encourage the babies to attach. If the mother is expressing, check her technique (see 2.5)
Engorgement	<ul style="list-style-type: none"> Effective positioning and attachment (see 2.2.3) Adequate milk removal from each breast (see 2.5) 	<ul style="list-style-type: none"> Check the babies' positioning and attachment (see above). Some women find placing warm flannels on the breasts before a feed can help relieve discomfort. It may help if mother expresses excess milk (see 2.5). Mention that excess milk can be expressed and frozen for later use (see 2.5)
Mastitis and blocked ducts	<ul style="list-style-type: none"> Effective positioning and attachment (see 2.2.3) Adequate milk removal from each breast (see 2.5) Advice on restrictive clothing. 	<ul style="list-style-type: none"> Check babies' positioning & attachment (see above). Alternative positions for positioning the babies may help overcome unilateral attachment problems and thus facilitate the drainage of affected lobes. Analgesia helps relieve discomfort. Some women find placing warm flannels on the breasts before a feed can help relieve discomfort. Continue frequent, unrestricted feeding from the affected side where possible. Check expressing technique. Express breastmilk by hand if breastfeeding is too painful or if the breast is not emptied after the feed. For infective mastitis or mastitis that doesn't resolve, an antibiotic compatible with breastfeeding and effective against Staph aureus (the most common infecting organism) should be given.

Insufficient milk - real and perceived

A common concern among mothers of multiples and sometimes among the health professionals caring for them is whether there is enough milk to feed two or more babies. It is perfectly possible for a mother to produce enough milk to exclusively breastfeed two, three or even four babies (see Summary of evidence below). Evidence of adequate milk supply is also found in studies of breastmilk pumping in which mothers of multiples produce more milk than mothers of singletons (see Summary of evidence below). The fact that some women can achieve such high volumes of milk, however, will not guarantee sufficient milk for all mothers of multiples. In the two surveys which studied reasons for breastfeeding cessation in multiples, "insufficient milk" was a common reason for stopping (see Summary of evidence below). Importantly, there was no evidence that it was more common in twins than in singletons, suggesting that this is a common (perceived) problem in all breastfeeding mothers in settings such as the UK and US.

Is it possible for mothers to produce enough milk to breastfeed more than one baby?

Summary of evidence

It is possible for a mother to produce enough milk to breastfeed more than one baby:

- High breastfeeding rates in twins in settings where breastfeeding is the norm e.g. in a large demographic and health survey in Malawi, Tanzania and Zambia (n=18,214 singletons and n=706 twins), 98.5% of singletons and 98.5% of twins were breastfed for at least 6 months (Justesen 2000). [level 2+]
- In a Japanese cross-sectional study, 3.6% of 258 sets of triplets/higher order multiples received expressed breastmilk (EBM) for up to 6 months (Yokoyama 2004). [level 2-]
- There are case studies of triplets (Storr 1989) and quadruplets (Mead 1992, Auer 1998, Berlin 2007) all of which report breastfeeding continuing for at least 12 months in all babies, including periods of exclusive breastfeeding. [level 3]
- In a qualitative study of 9 sets of triplets, 5 sets received EBM; 1 set received EBM for 6 months (Leonard 2000). [level 3]
- In a case study of quintuplets, all babies were receiving EBM (approximately half mother's own milk and half donor breast milk) at 7 months (Szucs 2009). [level 3]

Mothers of multiples produce more milk than mothers of singletons:

- A US study of 125 mothers of preterm (<30 weeks' gestation) singletons and multiples found that the mean 24 hour milk volume was significantly higher in mothers of multiples (599 ml) compared with singletons (430 ml) despite similar pumping frequency and other characteristics (Lau 2004). [level 2-]
- In an Australian study, mothers of twins typically produced at least 2100 ml/24 hours compared with 1100 ml/24 hours in mothers of singletons (Hartman 1984). [level 3]
- In the US, a breastfeeding mother of quads pumped 3.24 litres of milk per 24 hours while in NICU (Berlin 2005). [level 3]
- An Australian study estimated milk yield in 8 mothers of twins and 1 mother of triplets by weighing the mothers (Saint 1986). At 6 months the milk yield for individual breasts of 3 mothers who were exclusively breastfeeding was 0.84-2.16 kg/24 hours and for 4 mothers who were partially breastfeeding, it was 0.42-1.39 kg/24 hours. In the mother who exclusively breastfed 2.5 month old triplets the milk yield for her combined breasts was 3.08kg/24 hours; she fed the babies 27 times/24 hours. [level 3]

Do women who are breastfeeding multiples stop breastfeeding because of real or perceived insufficient milk?

Summary of evidence [level 2-]

The fact that some women can achieve such high volumes of milk, however, will not guarantee sufficient milk for all mothers of multiples.

Evidence from the 2005 Infant Feeding Survey and the US study

- 22-55% of women mentioned "insufficient milk" as a reason for stopping breastfeeding depending on the survey and time point.

Given motivation and support, most women can produce sufficient milk to breastfeed multiples, although there is also compelling evidence that women commonly cite insufficient milk as the reason for stopping breastfeeding. Below are some suggested practice points for resolving feeding problems which arise due to insufficient milk.

Potential problems related to insufficient milk		
Problem	Prevention	Treatment/solution [grade E]
<i>Insufficient milk</i>	<ul style="list-style-type: none"> Effective positioning and attachment (see 2.2.3) Frequent feeds (see 2.2.5) Frequent expressing (see 2.5.3) Adequate rest Reassurance and support 	<ul style="list-style-type: none"> Listen to the mother to find out her symptoms and perceptions. Check for signs that the baby is receiving (or not receiving) sufficient milk as indicated in the next box. Observe the baby feeding at the breast. Establish whether “true insufficient milk” or “perceived insufficient milk” (perceived insufficient milk is described further down this box). Establish the cause of insufficient milk and then treat accordingly. If it is due to: <ul style="list-style-type: none"> Poor positioning or attachment then see above. Too few feeds then increase the frequency of feeds (see 2.2.5). Infrequent expressing then increase the frequency/duration of expressing (see 2.5.3). Stress or anxiety then support the mother and initiate appropriate strategies to minimise their effects. Exhaustion then encourage the mother to rest more and get help from others. Maternal medication (e.g. some oral contraceptives, stimulant laxatives and combination cold/flu remedies that contain pseudoephedrine may affect milk supply). Check for an alternative from NHS Drug Information Centres or the following: Drugline 0844 412 4665 www.breastfeedingnetwork.org <p><i>Hale T. Medications and Mothers' Milk. 11th Edition. Pharmasoft Publishing L.P. Amarillo, Texas, USA.</i></p>

continued on facing page >

Potential problems related to insufficient milk <i>(continued from facing page)</i>		
Problem	Prevention	Treatment/solution [grade E]
<i>Insufficient milk</i>		<ul style="list-style-type: none"> If insufficient milk persists or no cause can be established then a galactagogue may be useful e.g. domperidone maleate. Always monitor for side effects and continue supporting the mother. Breast massage and relaxation may help. Maternal diet and fluid intake will not affect milk supply significantly unless she is very dehydrated or severely malnourished. However, a poor diet or insufficient fluid may affect the mother's wellbeing and this will not help with breastfeeding. Encourage the mother to have a good diet of regular meals and a good fluid intake.
<i>Perceived insufficient milk (i.e. babies fine but mother perceives a problem)</i>	<ul style="list-style-type: none"> Accurate and consistent advice should be given by trained and skilled health professionals. 	<ul style="list-style-type: none"> Listen to the mother to find out her symptoms and perceptions. Reassure her by giving appropriate information e.g. about normal size of breasts, appearance of milk, frequency of feeds, that it is possible to produce sufficient milk for multiples. Refer to the signs that the baby is receiving (or not receiving) sufficient milk as indicated in the next box. Be encouraging - that it is possible to breastfeed multiples. Check whether practical or social support is needed. Discuss sources of practical help and give information on support groups. Discuss and explain any conflicting advice received.

Signs that an exclusively breastfed baby is receiving (or not receiving) sufficient milk

Many of these are taken from a recent breastfeeding CD (Spencer 2009) and an NCT information leaflet (McNally et al 2008).

Mothers can be reassured that there is no problem with their milk supply if several of the following signs are present:

- The mother has experienced a degree of breast enlargement during pregnancy.
- The mother has experienced a degree of postpartum breast fullness.
- The mother experiences milk dripping from the opposite side while infant suckles.
- Parents can hear swallowing throughout the feed.
- The baby regains birth weight by day 7-10.
- Urine pattern is normal i.e. passes urine at least twice per day on days 1-2, at least 3 times per day on days 3-4 (several soaked nappies, feeling heavier than previously), has at least 5 heavy nappies on days 5-6 and has at least 6 heavy nappies on day 7 onwards (if using disposables a cotton wool ball placed in the nappy makes it easier to assess urine output; alternatively, add 3 tablespoons of water to a dry nappy and pick it up - this is "a heavy nappy").
- Stooling pattern is normal i.e. on days 1-2 meconium passed frequently, on days 3-4 stool looks more green (2 or more per day), on days 5-6 yellow stools (2 or more per day), on day 7 onwards soft yellow stools (2 or more per day).
- The parents respond quickly to infant hunger cues and the infant suckles well.
- The baby ends feed when satisfied and settles between feeds.
- The baby is gaining weight well on breastmilk alone.

Signs of severe dehydration include:

- The baby has dry gums, sunken eyes and depressed fontanelles - seek help urgently

Signs that the baby may not be receiving enough breastmilk include:

- Urine and stooling patterns not normal.
- Poor growth or losing weight (See Section 2.4.3).
- The baby is unsettled after feeds.
- Lethargy.
- Several of the signs in the first section of this box are absent.

2.4.2 Related to the mother

Breastfeeding problems may arise because the mother has other problems which are not related to the breastfeeding process. A mother of multiples is more likely to have been delivered by a caesarean section, which in turn may make it physically more difficult to breastfeed multiples. For example, she may not be able to pick up the babies, she may not be mobile, and she may be in pain. If the mother had other complications at delivery such as postpartum haemorrhage or retained placenta then these may temporarily affect her milk supply. "Mother ill" was a relatively uncommon reason for stopping breastfeeding in both surveys (see Summary of evidence below). A more common problem among mothers of multiples is exhaustion (see Summary of evidence below).

Do women who are breastfeeding multiples stop breastfeeding because she is ill or exhausted or breastfeeding takes too long?

Summary of evidence [level 2-]

Evidence from the 2005 Infant Feeding Survey & the US study

- "Mother ill" was a relatively uncommon reason for stopping breastfeeding in both surveys: mentioned by 3-17% of mothers of twins depending on the survey and time point.
- "Exhaustion/takes too long" was a common reason for stopping breastfeeding in mothers of twins in the Infant Feeding Survey (mentioned by 19-41% of mothers), whereas "time/burden" was a common reason for stopping in the US survey (30-32% of mothers), as was "energy/fatigue" (8-17% of mothers).

Below are some suggested practice points for resolving feeding problems which arise due to the mother being ill or exhausted.

Potential problems related to the mother	
Problem	Treatment/solution [grade E]
Mother ill	<ul style="list-style-type: none"> • Explain to the mother that some illnesses may temporarily affect milk supply e.g. retained placenta, postpartum haemorrhage. • For most illnesses and medications, it is not necessary to stop breastfeeding if she has appropriate support. There is now some information in "Birth to Five". • The mother should rest; she can breastfeed the babies in bed. • Help the mother with expression if appropriate. • Discuss sources of practical help available.
Exhaustion/ takes too long	<ul style="list-style-type: none"> • Acknowledge how the mother is feeling. • Discuss ways in which the mother can rest more and discuss sources of practical help available. Try to involve her partner/family in these discussions about others helping with practical tasks so that the mother can breastfeed. • Discuss what normal feeding patterns are (feeding can take a long time even with singletons) but that this will change over time. • Feeding can be a time for the mother to rest, a special time for bonding with her babies. • Check that the mother's diet is adequate - a poor diet may make her more tired or less able to cope. • It may be appropriate to discuss partial breastfeeding rather than stopping breastfeeding altogether (see Section 2.8.1). Note that formula feeding can take more time than breastfeeding if the mother doesn't have much support.

2.4.3 Related to the babies

Concerns about breastfeeding may arise among health professional and parents because the babies are ill or are not growing sufficiently. This is a common reason for stopping breastfeeding, particularly among those multiples who are born preterm or admitted to special care (see Summary of evidence below).

Do women who are breastfeeding multiples stop breastfeeding because the babies are ill or exhausted or have poor growth?

Summary of evidence [level 2-]

Evidence from the 2005 Infant Feeding Survey and the US study

- "Poor growth/losing weight" was not a common specific reason for stopping breastfeeding in either survey (mentioned by 0-8% of mothers of twins).
- Among the twins who were admitted to special care in the 2005 Infant Feeding Survey, the reason for stopping breastfeeding given by 36-43% of mothers was "babies ill" (including premature and losing weight)".

Below are some suggested practice points for preventing and resolving feeding problems which arise due to sick babies or poor growth.

Potential problems related to the babies	
Problem	Treatment/solution [grade E]
Babies ill	<ul style="list-style-type: none"> For babies who are preterm or admitted to special care, see 2.3. Reassure the mother that for many illnesses, the babies will benefit if they continue to receive breastmilk, particularly if the babies are preterm.
Poor growth/losing weight	<ul style="list-style-type: none"> When assessing for poor growth, note that: <ul style="list-style-type: none"> the babies should be treated as individuals rather than being directly compared with their co-sibling(s). use the appropriate growth charts which may be downloaded from the RCPCH website (http://www.rcpch.ac.uk/Research/UK-WHO-Growth-Charts). Current growth charts are for term and preterm singletons. There are no growth charts for multiples. the growth patterns and health of the babies, together with the size of the parents, should be taken into account. Try to establish the cause of poor growth and then treat accordingly. If it is due to: <ul style="list-style-type: none"> Ineffective milk transfer then check positioning and attachment (see 2.2.3) and check for tongue tie (see NICE 2005). Too few feeds then try to increase the frequency of feeds (see 2.2.5). This may include waking the babies to feed them. Feeds being too short and not getting enough (hind) milk then suggest letting each baby finish the feed before taking off the breast If a baby is not gaining weight or is losing weight and none of the above seem to be causing this then refer to a medical practitioner in case there is an underlying medical condition. If the mother is willing and able to try these measures then this is the recommended approach. It would not be helpful to use top-up formula since this may affect her confidence in breastfeeding and reduce her milk supply, which in turn may affect her ability to breastfeed. If the mother does not wish (or is unable) to try these measures, then top-up formula might be helpful. In cases where there is a clinical need for supplementation with donor milk or formula, such as where one or more babies are failing to thrive on the breast alone, the mother should be supported through this time with the long term aim of getting the babies back to full breastfeeding.

2.5 Expressed breastmilk

2.5.1 Expressed breastmilk

When breastfeeding is not (yet) possible, an alternative way of ensuring that a baby receives breastmilk is to feed expressed breastmilk via a tube, cup or bottle. The processes of collecting, refrigerating and freezing expressed breastmilk may affect some of its immunological and nutritional

properties (NICE 2008). However, the health outcomes of babies fed expressed breastmilk are believed to be better than in babies fed formula. When the mother's own milk is unavailable or in short supply, donor breastmilk may be used as an alternative. Donor breastmilk is pasteurised, and this affects some of the immunological and nutritional properties of the milk (Lawrence 1999). However, preterm babies fed donor breastmilk have a lower risk of NEC than those fed formula milk (Quigley 2007b).

In a US study of 346 babies, 68% of babies received at least some breastmilk, and 77% of these received some expressed breastmilk, irrespective of the babies' gestation and whether they were singletons or multiples (Geraghty 2005). In other words, there were many healthy singletons who received expressed breastmilk at some point. It is unclear why these mothers, particularly those of healthy singletons, chose to express so often and whether the prevalence of expressing is as high as this in other settings.

2.5.2 Reasons for expressing milk

There are several situations when breastfeeding is not possible and expressed breastmilk is the next best feeding option. For example, if the babies are too preterm or sick to breastfeed, or if the mother needs to be away from her babies such as when she returns to work. The first box below shows the situations when it may be necessary or helpful to express milk.

One of these situations is particularly relevant to multiples. Expressing is sometimes used as a long term feeding strategy, particularly in higher order multiples. In a Canadian study of nine sets of breastfeeding triplets, five sets were exclusively breastfed, whereas in the other sets, the mother tended to breastfeed one or two babies at each feed, express between or after feeding, and feed the remaining baby(s) a combination of expressed breastmilk and formula (Leonard 2000). However, the attitudes among the mothers about expressing varied. For some, it was "a hassle but a necessary one if I am to give them breastmilk." Some felt reassured because they knew how much milk the babies were getting and others could feed the babies. Others intensely disliked expressing. In a US study of 123 mothers of twins, of whom 110 initiated breastfeeding, the burden of pumping was cited as the reason for giving up breastfeeding at one month corrected age in 3 out of 10 women and at 6 months corrected age in 5 out of 37 women; one woman stated about pumping "It was like having a third child" (Damato 2005).

When it may be necessary or helpful to express milk:	
<p>For sick or preterm babies:</p> <ul style="list-style-type: none"> If an infant is too preterm or sick to breastfeed directly then expressing will provide breastmilk for oral feeds. To establish and maintain the mother's milk supply - even if the babies are not yet receiving the milk. <p>To optimise and increase the milk supply.</p> <p>When learning to breastfeed</p> <ul style="list-style-type: none"> To encourage the baby to latch on in the early days of establishing breastfeeding - here the mother hand expresses a few drops of milk onto her nipple. <p>To help relieve breastfeeding problems</p> <ul style="list-style-type: none"> When the mother's breasts feel full and uncomfortable (engorged) and the baby is having trouble attaching. To help relieve a blocked duct or mastitis. 	<p>To allow other people to feed the babies:</p> <ul style="list-style-type: none"> If the mother needs to be away from her infant for a few hours or longer (e.g. if the mother is hospitalised) or if the mother is returning to work. <p>As a (long term) feeding strategy:</p> <ul style="list-style-type: none"> Some women choose to (exclusively) feed their baby(s) expressed breastmilk rather than breastfeed. Sometimes women choose to feed their babies expressed breastmilk in combination with breast and/or formula feedings - this is particularly common in multiples, especially higher order multiples, so that other people can help with feeding. See Section 2.10.
<p>When expressing is neither necessary nor helpful:</p> <ul style="list-style-type: none"> For babies who are able to feed at birth or when trying to establish breastfeeding, it is preferable to put the baby to the breast rather than feed them breastmilk via a cup or bottle. There is no need to use expressing to establish a good milk supply in multiples who are able to breastfeed directly - breastfeeding will establish a good milk supply. 	

2.5.3 How to express and how often to express

A Cochrane review of different methods for expressing milk identified 12 studies but the number of women contributing to the analysis of separate comparisons or outcomes was very small (Becker 2008). Hence, these results require careful interpretation. Electric pumps were associated with greater volumes of milk expression compared with hand expression although the differences may not be clinically significant and were based on a small number of women (24 used an electric pump, 29 used a manual pump and 19 hand expressed) (Becker 2008).

Simultaneous pumping was associated with taking significantly less time than sequential pumping (an average of 3.5 hours per week less based on one study of 32 women). Three studies compared milk volume produced with simultaneous and sequential pumping. In two studies (based on 49 and 32 women), simultaneous pumping was associated with a small increase in milk volume but this effect was not statistically significant in either study alone or when they were combined (Becker 2008). In a third study of 36 women, simultaneous pumping was associated with a significant increase in milk volume, when combined with breast massage and when not combined with breast massage (Jones 2001). The reasons for expression and the mother's own preferences are likely to affect the effectiveness of the different methods for expression.

The boxes below summarise the different methods used to express breastmilk and the suggested timing and frequency of expression. Further information on expressing may be found in the Bliss booklet (Jones 2009) and the UNICEF paper "*Principles to promote the initiation and establishment of lactation in the mother of a preterm or sick infant*" (which may be downloaded at www.babyfriendly.org.uk/pdfs/Liz_Jones_article_full.pdf).

Methods used for expressing breastmilk:	Timing and frequency of expressing
<ul style="list-style-type: none"> Hand expression - useful for expressing a few drops of milk from the breast, or for relieving uncomfortable breasts, or for expressing immediately after birth when there is only small amount of colostrum to express straight into a syringe. Some women prefer hand expressing to using a pump. Some women hand express when they are out and about, or as a long term strategy when they can't afford a pump. A manual breast pump - useful for occasional expressing or more regular or long-term expressing. An electric/battery breast pump - useful for occasional expressing or more regular or long-term expressing. Can do double pumping i.e. simultaneous pumping of both breasts. For sick or preterm multiples, a hospital-grade electric pump would often be used. Double pumping from both breasts at the same time is quicker than sequential pumping, therefore, a double pump might be useful for expressing over a long period of time. Mothers may have their own preference for each of the above. <p>Care should be taken to wash hands and disinfect all feeding equipment (see Section 2.6).</p>	<ul style="list-style-type: none"> To establish milk production: The first two weeks are important in establishing the milk supply. The ideal is to produce 750-1000 ml per day by day 10-14. Milk production is likely to be increased if feeding and pumping are: <ul style="list-style-type: none"> Initiated <i>early</i> - preferably within the first 6 hours after delivery Done regularly - approximately the same time each day/night Done frequently - every 2-3 hours during the day with a 4-6 hour break at night (but ideally a 4 hour break until a copious supply is achieved), or an average of 8 times per 24 hours To increase milk supply: <ul style="list-style-type: none"> Add an extra expressing session at night since this is when prolactin is highest and milk supply is high. Use a double pump. As a longer term feeding strategy <ul style="list-style-type: none"> If expressing is used to supplement breastfeeding, then breastfeed first and then express. <p>Further details may be found in the UNICEF paper "<i>Principles to promote the initiation and establishment of lactation in the mother of a preterm or sick infant</i>" at www.babyfriendly.org.uk/pdfs/Liz_Jones_article_full.pdf.</p>

Further practical information on expressing:

- Milk supply may be reduced or delayed by certain drugs e.g. corticosteroids before delivery.
- Be careful with the use of galactagogues - it is better to identify the reason for the poor/delayed milk supply first and address this (see Section 2.4).
- Some women find expressing easier by being close to the babies, holding a photo or their clothing, using relaxation techniques. Other women may prefer to be away from the baby(s) when expressing.
- Make sure that the pump has the appropriate funnel size for the woman's breasts, otherwise expressing may hurt or be less effective.
- Postnatal ward staff need to be trained in expressing and they need access to sufficient expressing equipment.

2.5.4 Storage of expressed breastmilk

Expressed breastmilk may be stored in a fridge or freezer under certain conditions which differ for "hospital" and "home". There are guidelines on the storage of expressed breastmilk at home (DH 2007, NICE 2008) and in hospital (FSA/BDA 2007) and these are summarised in the boxes below.

Storage of expressed breastmilk at home	Storage of expressed breastmilk in a hospital
<p>Advise mothers that expressed milk can be stored for:</p> <ul style="list-style-type: none"> up to 5 days in the main part of a fridge, at 4°C or lower up to 2 weeks in the freezer compartment of a fridge up to 6 months in a domestic freezer, at minus 18°C or lower. <p>Advise mothers who wish to store expressed breast milk for less than 5 days that the fridge preserves its properties more effectively than freezing.</p> <p>Advise mothers who freeze their expressed breast milk to defrost it in the fridge and not to re-freeze it once thawed. Advise mothers never to use a microwave oven to warm or defrost breast milk.</p> <p>Expressed breastmilk should be stored in labelled bottles.</p> <p>Care should be taken to clean and sterilise all feeding and expressing equipment (see Section 2.6).</p> <p>Once thawed, expressed breast milk should be used within 24 hours of the start of the defrosting process.</p>	<ul style="list-style-type: none"> Dedicated fridges or freezers or where this is not practical, dedicated storage boxes for use in the fridges or freezers should be available for storing expressed breastmilk at 2°C- 4°C and -20°C, respectively. Expressed breastmilk should only be stored within a suitable fridge for up to 48 hours and, if not used, discarded. If there is any reason why it may not be used within that time it should be frozen directly after expressing. Frozen expressed breastmilk can be stored in a suitable freezer at -20°C for up to 3 months. Expressed breastmilk should be stored in plastic sterile containers. <p>Further details may be found in the FSA/BDA guidelines "<i>Guidelines for making up special feeds for infants and children in hospital</i>" (http://www.food.gov.uk/multimedia/pdfs/publication/babypowdertoolkit1007)</p>

2.6 Sterilisation and preparation of feeding equipment

This section refers to the sterilisation and preparation of all feeding equipment, including bottles, teats, cups, and breast pumps. It also includes the preparation of formula milk. Please refer also to the sections on expressed breastmilk (Section 2.5) and formula milk (Section 2.7).

Key issues

In recent years, there have been some major changes to guidance on the preparation of infant formula both in hospital and at home. Infant formula powders are not sterile. Therefore, water boiled at a temperature of 70°C or higher is required and feeds should preferably be made just prior to feeding rather than up to 24 hours prior to feeding. Parents who have older children may not be aware of these changes so should be educated by hospital staff and/or community health professionals. Details are given in the boxes below together with some of the special issues for multiples.

Current guidance on the preparation of infant formula

- Guidance from the Department of Health for England on the preparation of infant formulas at home for health professionals together with a practical information leaflet for parents is available at: http://www.dh.gov.uk/en/Healthcare/Maternity/Maternalandinfantnutrition/DH_4123674
- Guidelines for the preparation of feeds in hospital have been produced for the UK and are published by the Food Standards Authority and are available at: <http://www.food.gov.uk/multimedia/pdfs/publication/babypowdertoolkit1007>

Current guidance on sterilisation of feeding equipment

- The above guidance also includes sterilisation of feeding equipment.

Special issues for multiples

- Making up formula feeds “fresh for each feed” rather than several hours in advance may require careful co-ordination e.g. if the babies are being fed at different times.
- Bottles, cups, etc, should be clearly labelled for each baby.
- If babies are being fed at the same time (particularly triplets and quads), the bottles, cups, etc, should be clearly labelled for each baby. This enables the parents to keep a record of how much each baby takes, if necessary.

2.7 Formula feeding

This section refers to formula feeding. The preparation of formula milk and the disinfection of feeding equipment are covered in Section 2.6. For combining breastfeeding and formula feeding, all of the previous sections on breastfeeding, expressing, etc, should be read. It should be noted that follow-on formula is not required.

Parents of multiples may elect to feed their babies formula milk for a variety of personal and physical reasons. The decision may be guided by their desire to share the task of feeding with others. If both parents are involved with feeding then each baby will receive undivided attention from both parents. Parents who want to feed their babies formula should be supported in their decision and given appropriate information, as described in the box below.

Parents may decide to feed their babies formula for a variety of reasons, at a variety of times:

- For parents who decide to supplement breastfeeding with formula milk, refer also to the previous sections on breastfeeding and expressing.
- For parents who decide to formula feed because of difficulties with breastfeeding or expressing, consider whether these difficulties can be overcome with practical help or support (see Sections 2.4 and 2.5).
- For parents who decide to stop breastfeeding or expressing, support them with their choice and give them full information about formula feeding. Give advice about suppression of lactation (see Section 2.8.1).
- For parents who decide to formula feed from the start, support them with their choice and give them full information about formula feeding.

The topics that are specific to multiples include simultaneous versus separate feeding, feeding frequencies and patterns, and rotating babies between feeders. Some of the recommended practice points on these issues are on the facing page.

How to formula feed multiples

some recommended practice points [grade E]

Sterilising feeding equipment • See Section 2.6

Preparing and storing infant formula • See Section 2.6

Type of formula e.g. preterm formula • See Section 2.11

Simultaneous versus separate formula feeding:

- It is generally recommended that babies are fed and held separately so as to maximise interaction with the carer.
- If both (all) babies wake together, it is possible to feed two babies at the same time using one of the following positions:
 - Older babies, who can sit up with support, may be positioned in an infant seat and the mother can sit near both of them, holding a bottle in each hand.
 - The mother can put one baby in an infant seat or support pillow and hold one baby in her lap, again holding a bottle in each hand.
- Bottle propping should be discouraged and a baby should never be left alone with a bottle.
- Use of hands-free feeding systems (e.g. Potee tubes) should be avoided. The tubes are narrow and hard to clean properly. It is important that the mother (or person doing the feeding) holds the bottle. If the babies are left alone to feed themselves then they could choke.

Rotating babies between people helping with feeding:

- If more than one person is involved in feeding the babies, it is generally recommended that babies are rotated between these people, so that there is interaction and stimulation between each baby-adult pair.

Feeding patterns:

- Many mothers of multiples adopt the “modified baby-led” approach. Here, whichever baby awakens first, is fed first. Then the second baby is gently awakened and fed, so that the mother has a reasonable interval until the next feed. The main drawback to this approach is that the awakened baby may be difficult to arouse and may not feed so well, although most babies usually get into this pattern fairly quickly.
- Other feeding patterns may work better, depending on the carers and the number and age of the babies.

Poor growth versus overfeeding:

- Parents may have anxieties about the babies gaining enough weight, particularly if they are born preterm. On the other hand, care must be taken to avoid overfeeding, particularly if the “modified baby-led” approach is adopted. Growth charts can help monitor this.

Exhaustion:

- Feeding multiples is a time-consuming experience whether the babies are breastfed or formula fed. The mother particularly will need help and support:
 - One way is to allow the father (or anyone else) to help with feeding or preparation of formula or sterilisation of feeding equipment.
 - The father (or anyone else) may be able to help with night time feeding. For example, it is possible for both mother and father to have occasional periods of uninterrupted sleep e.g. the mother can feed both (all) babies at the first night time feed while the father sleeps, and then the father can handle the second night time feed by himself.
 - Seek the help of organisations such as Home Start (www.home-start.co.uk).

Skin to skin contact and cuddling:

- These are important in formula-fed multiples and should be encouraged.

2.8 Ongoing feeding support

2.8.1 Feeding options including different ones for co-siblings

An individual feeding plan should be put together before the mother and her babies are discharged from hospital. Once they are discharged, they will continue to need support with feeding. Different decisions about feeding may be needed at different points in time (see boxes below).

<p>Ongoing feeding options - these may change over time:</p>
<p>Breastfeeding :</p> <ul style="list-style-type: none"> • For practical advice about breastfeeding, see Section 2.2. • For advice about how to stop breastfeeding multiples, see facing box.
<p>Expressed breastmilk (EBM):</p> <ul style="list-style-type: none"> • For practical advice about expressing, see Section 2.5. • Some mothers of multiples (particularly triplets and quads) find expressing to be a useful long term feeding strategy so that others can help with feeding. • Expressing is useful when returning to work (see Section 2.8.5).
<p>Formula feeding:</p> <ul style="list-style-type: none"> • For practical advice, see Section 2.7.
<p>Mixed feeding i.e. different combinations of the above:</p> <ul style="list-style-type: none"> • It is important to explore the mother's goals with regard to breastfeeding before giving advice about supplementation with formula. The earlier a formula supplement is given, the more the breastmilk supply may be compromised. • For practical advice, refer to sections on breastfeeding, expressing and formula feeding.

Changing the feeding methods or practice

Some recommended practice points [grade E]

How to stop breastfeeding

- It is important to explore the mother's goals with regard to breastfeeding before giving advice about supplementation with formula, or stopping breastfeeding. The earlier a formula supplement is given, the more the mother's milk supply may be compromised.
- When stopping or reducing breastfeeding, once a good milk supply is established, then this should be done gradually, otherwise the mother may be at risk of blocked ducts or mastitis. When the babies are less than six months old and the mother wishes to stop, the usual practice is to change one breast feed for a formula feed per day and to allow the breasts to fully adjust before dropping another breastfeed.
- Parents' decisions about feeding should be respected and supported. Mothers may experience personal guilt if they stop breastfeeding. They should be commended for the length of time they chose to breastfeed, even if this was for a few days.

Introducing complimentary foods/solids (i.e. weaning)

- See Section 2.9

It is possible for co-siblings to be fed differently from each other (see box below).

Different feeding patterns for co-siblings

Some recommended practice points [grade E]

- When considering feeding options, it is important to consider the needs of the individual babies together with those of the mother and her circumstances.
- It is likely that the co-siblings will have different feeding patterns. This may be driven by the babies, for example, their size and weight may differ considerably, they may have different temperaments, or one baby may "refuse" a particular pattern (e.g. to take breast/formula milk from a bottle).

2.8.2 Providing ongoing support

Once a mother and her babies are discharged from hospital, they will continue to need support from health professionals. A care plan should be put in place to facilitate the transition of care from the maternity/neonatal units to the staff in the community. Good communication and consistent advice about infant feeding are essential. Mothers of multiples are more likely to become depressed compared with mothers of singletons. The care plan will provide a useful yardstick for the future and also offer a valuable opportunity to discuss feeding, expectations of childcare and parenthood.

Practical advice can be given about breastfeeding and other aspects of feeding. Guidance can also be given about practical preparations and purchases such as refrigeration and sterilising equipment. Mothers are more likely to discuss any worries in a one-to-one chat at home than in an antenatal class or busy antenatal clinic. The box below includes some recommended practice points for those providing ongoing support to parents of multiples.

<p>Ongoing support and advice</p>
<ul style="list-style-type: none"> • Good communication between hospital and community health professionals is essential. • Health professionals and voluntary workers should give accurate and consistent information to parents of multiples; training will help ensure that this happens. • Professionals and support groups can help by working closely with the mother and babies, and adapting their ideas to fit in with the individual circumstances. • If possible, more frequent home visits enable the community midwife and health visitor to get to know the family better and to offer advice and support that are appropriate to their needs. Attending baby clinics can be difficult for mothers of multiples. Health visitors should be encouraged to make home visits to weigh the babies for at least the first month. • It is important to allocate an individual appointment to each baby both at home and at the clinic. A twin or a triplet needs the same amount of time that would be given to a singleton. • Ensure that the mother and other carers are informed about the support groups and other helpful organizations (see Section 4). • Health professionals should be aware that mothers of multiples will need more emotional and practical support, and may be more likely to become depressed. • Advise the parents (ideally antenatally) to plan who will do the household chores and help look after the babies. If there are sufficient domestic funds then a cleaner or other hired help will be useful, even for a few weeks. • Fathers play a crucial role and will be required to be more involved with practical care even more than with a singleton. Advise the fathers that tasks they may view as simple and unimportant may be extremely helpful e.g. bringing the babies to the mother for feeding, helping with positioning the babies, burping the babies, changing nappies, sterilising feeding equipment, etc.

2.8.3 Breastfeeding multiples in public places

Many mothers have anxieties about breastfeeding in public places. For mothers of multiples, breastfeeding two or more babies in public may be an even more daunting prospect. However, with good preparation and planning, it is perfectly possible to breastfeed multiples in public places. The box below includes some helpful tips.

Practical tips to give mothers about breastfeeding in public places [grade E]

- **Nursing bras:** Most mothers will need at least three or four well-fitting, comfortable nursing bras.
- **Clothing:** Many mothers will be concerned about revealing parts of their breasts and tummies in public. They should wear clothes which provide easy and discreet access to the breasts e.g. clothes that can lift up easily. The babies' clothes should allow easy nappy changing.
- **Separate versus simultaneous feeding:** Some mothers prefer to breastfeed separately rather than simultaneously while out and about because it is more discreet. Also, it might be difficult to attach and position the babies for simultaneous feeding in a public place, without her usual chair, cushion, helpers, etc.
- **Building confidence:** Attending a breastfeeding support or multiples support group will give mothers the confidence that they are not alone.
- **Breastfeeding-friendly places:** Encourage the mother to make a list of all the local places where breastfeeding is easy e.g. a particular café or infant/toddler group or a friend's house. There are breastfeeding rooms in some supermarkets, department stores, etc. Encourage her to try to plan trips out so that she is within easy reach of such places.
- **Going alone:** The mother should try to have someone with her until she is confident about breastfeeding in a public place.

2.8.4 Feeding multiples when there are older siblings around

The birth of even one new baby often causes sibling rivalry. Older brothers and sisters are likely to find it even more difficult to come to terms with the arrival of twins or higher order multiples in the family. They are no longer the sole focus of their mother's attention, as they suddenly find themselves having to compete with two or more other people, whose care seems to take up every moment of the day. In order to gain attention, they may well resort to behaving badly at the most inconvenient moments such as feeding times. The box below includes some helpful tips for feeding multiples when there are older siblings around.

Practical tips for feeding multiples when there are older siblings around [grade E]

- A breastfeeding mother with an older child may find it more convenient to feed her babies separately, as she will still have a free arm for another child e.g. to read a story or reach out to the child.
- Breastfeeding can be made into a positive time for other siblings e.g. it might signal story time, when a young sibling can crawl up beside the mother and have a story. Or have a small toy box with special toys, books or DVDs to use when feeding.
- Fathers and other carers can help occupy the older child while the mother concentrates on feeding.
- It may be helpful occasionally to invite a visitor specifically to give attention to the older sibling during a feeding time.
- Depending on the age of the child, it may be possible to involve him or her with the babies' care to some extent. Indeed, some sisters and brothers prove themselves absolutely invaluable.
- Giving 5 minutes of the mother's time now when an older child needs it may be more beneficial than giving them an hour, when it is more convenient for her. A quick cuddle, setting up the favourite toy, starting them off doing homework, may occupy them sufficiently so that she can look after the babies.

2.8.5 Going back to work

Mothers who are returning to work and want to continue breastfeeding are able to do so with careful planning. The box below includes some helpful tips for continuing to breastfeed multiples after returning to work.

Practical tips for breastfeeding multiples after returning to work [grade E]

- **Expressed breastmilk in the freezer:** Before going back to work, the mother can build up supplies of expressed breastmilk in the freezer, which can be fed to her babies during the day, whilst she is at work. These supplies could be from when there was an excess of milk or she may have chosen to express to build up a supply in the freezer. Note that frozen breastmilk has to be stored in certain conditions and used up within a certain time as described in Section 2.5.4.
- **Others who are feeding the babies:** If others are feeding multiples expressed breastmilk while the mother is at work then they need to be aware of the conditions for storing expressed breastmilk (Section 2.5.4) and of any issues specific to feeding multiples e.g. the co-siblings will have their own (labelled) bottles, they may have different feeding patterns.
- **Expressing at work:** If the mother wants to express at work then her employer must find a suitable room and allow her sufficient time to do this. The mother and her employer should be aware that expressing for multiples will probably take longer and require more equipment (e.g. bottles, storage space) than for singletons.
- **Breastfeeding:** Many working mothers breastfeed (directly) before going to work in the morning and again on their return, particularly if they work short hours, although other patterns suit other working mothers (e.g. some mothers may work night shifts, workplaces with an onsite crèche may make direct breastfeeding possible). The health visitor or breastfeeding counsellor can give further information about this. A mother breastfeeding multiples before going to work will need to allow sufficient time to feed the babies and get them (and herself and possibly older siblings) ready before going to work.

2.9 Introduction of solids

2.9.1 When to introduce solids

Here, weaning is used to define the introduction of foods other than breastmilk or infant formula into an infant's diet. It is also often known as introduction of solids.

Our systematic review identified one UK study comparing the introduction of solids in preterm infants (n=253) which separated out singletons from twins (n=33 sets) and triplets (n=3) (Norris 2002). The study found that triplets started solids later but there was no difference between singletons and twins. Due to the lack of evidence specifically on multiples, we have to extrapolate from data on singletons and use current guidelines.

In 2003, the Department of Health recommended that solids should be introduced at about 6 months in breastfed and formula-fed babies (see first box overleaf). In reality it is likely that a set age alone is not a good indicator of any infant being ready to start solid foods and a number of cues might indicate readiness for starting solids (shown in the same box). Though written for singletons these guidelines are appropriate for multiples who were born at term.

In 2007, a joint consensus statement on weaning in preterm infants was produced by a group of UK paediatric dietitians and speech and language therapists. An evidence based best-practice statement has been produced and is available on the British Association of Paediatric Medicine (BAPM) website. Again, a number of infant readiness cues for starting solids are shown in the same box. Though written for singletons these guidelines are appropriate for multiples who were born preterm.

Recommended practice points for term multiples [grade E]

Follow the Department of Health guidance (www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4097197):

- “Breastfeeding is the best form of nutrition for infants. Exclusive breastfeeding is recommended for the first six months (26 weeks) of an infant’s life as it provides all the nutrients a baby needs”.
- About 6 months of age is the recommended age for introducing solids for all infants, whether breast or formula fed.
- Some guidance is offered to those who introduce solid foods after 4 months (17 weeks), but before 6 months.

Infant readiness cues - these should be assessed separately in each co-sibling

The guidance recommends that parents try giving solid foods when the baby:

- can sit up
- wants to chew and is putting toys and other objects in their mouth
- reaches and grabs accurately.

Recommended practice points for preterm multiples [grade E]

Follow the Joint consensus statement on weaning in preterm infants (see www.bapm.org/nutrition/guidelines/php/ (see “Weaning Preterm Infants”) with further details given in King 2009).

- Healthy preterm infants can usually safely start solids between 5 and 8 months from the date of birth (uncorrected age) although factors other than age should also be taken into account.
- For further information relating to starting solids in preterm infants see the Bliss website where the following booklet can be downloaded: www.bliss.org.uk/page.asp?section=584§ionTitle=Weaning+your+premature+baby

Infant readiness cues - these should be assessed separately in each co-sibling*

Infant cues that might be useful to look for as signs of readiness for starting solids are listed below. They are not essential nor should they be considered as cues for starting solids if they occur before 4 months (17 weeks) of age in infants born at term (>37weeks) or 3 months (13 weeks) from the expected date of delivery if born prematurely (<37weeks).

Positioning - the infant:

- Can be easily supported in a sitting position.
- Has some head control and a stable head position with/without support.

Behaviours - the infant is:

- Alert and appears ready for a new type of feeding.
- Showing an interest in others eating.
- Demanding feeds more frequently over a period of days including at night - although this should be assessed to ensure it is not just a growth spurt.

Oral Skills - the infant:

- Can breast, bottle or cup feed with efficiency.
- Has started to bring their hands to their mouth and explore fingers and/or toys with it.
- Has demonstrated a ‘munching’ movement when mouthing non food items.

Some factors can only be assessed once weaning has begun but their absence should not deter its progression as they are learned behaviours:

- Managing to clear the spoon with their lips; this develops with experience.
- Absence of tongue protrusion when feeding; this disappears gradually with time and maturity.

**adapted from the 2007 joint consensus statement on weaning in preterm infants*

2.9.2 How to introduce solids

The literal definition of the term weaning is ‘to accustom to’ and when it is used in the process of transferring from an all milk diet to a mixed diet, it suggests a gradual process, not an ‘all milk today, none tomorrow’ process.

Parents may find the introduction of solids a quite stressful period as they are responsible not just for the amount of nutrition their baby receives, but also for the balance of foods and therefore nutrition. Although nutrition is a science, feeding should be a pleasurable experience for all parties so a relaxed interpretation of available evidence should be applied. There should be guidance and not rules and wherever possible advice should be consistent. This is difficult when the evidence base is sparse, but common sense should apply.

Information on weaning/starting solids

For term multiples

Excellent information on starting solids/weaning is available for parents:

- based on the best available evidence from the Dept of Health for England at: www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4117080
- and in Scotland at: www.healthscotland.com/uploads/documents/8807-FunFirst%20FoodsEnglish.pdf

For preterm multiples

Information relating specifically to preterm infants is available on the Bliss website where a booklet can be downloaded: www.bliss.org.uk/page.asp?section=584§ionTitle=Weaning+your+premature+baby

2.10 Feeding triplets and quads

Key issues

Many of the previous sections on breastfeeding, formula feeding, expressing, etc, apply to higher order multiples, although there are some further points that will be helpful to consider. There is little published literature on feeding triplets and quads. Our systematic review identified a Japanese cross-sectional study including 234 mothers of triplets, 20 mothers of quadruplets and four mothers of quintuplets (Yokoyama 2004), a study of nine sets of triplets (Leonard 2000), a case study of triplets (Storr 1989), 3 case studies of quadruplets (Mean 1992, Auer 1998, Berlin 2007) and a case study of quintuplets (Szucs 2009). Some of the other studies included a small number of triplets although their data were not always analysed separately from the twins.

Mothers who are breastfeeding triplets or quads need to be reassured that they can produce enough milk for all babies. The above studies describe women exclusively and partially breastfeeding triplets and quads, and a woman partially breastfeeding quintuplets for seven months. A breastfeeding mother of quads pumped 3.24 litres of milk per 24 hours while in NICU (Berlin 2005). In another study which included a mother who exclusively breastfed 2.5 month old triplets, the milk yield for the combined breasts was 3.08kg/24 hours; she fed the babies 27 times/24 hours (Saint 1986).

Much of what has been written in the previous sections applies to triplets and quads. This section summarises some of the key issues in feeding higher order multiples, together with some practical advice. The section ends with some published case studies.

Different feeding options

The different feeding options for triplets and quads are summarised in the box overleaf.

Different feeding options [grade E]

Advise about feeding options:

- Almost all triplets and quads are born preterm and require special care. The mother is likely to be expressing.
- Explore the mother's goals with regard to breastfeeding and support her decision.
- Advise the mother that:
 - It is possible to breastfeed triplets and quads, and to produce sufficient milk to meet the needs of the babies.
 - Breastfeeding triplets and quads, particularly once discharged from hospital, requires commitment from the mother and much support and practical help from others.
 - Some breastmilk each day, no matter how little, is still of benefit.
- Parents' decisions about feeding should be respected and supported. Mothers may experience personal guilt if they stop (or do not initiate) breastfeeding.
- The mother will need extra help to ensure that she can eat and drink regularly.

Breastfeeding:

- Breastfeeding triplets and quads - help may be needed with night feeds, and help will be needed with housework, cooking, shopping, etc, so that the mother can put all her available time and energy into feeding. It is a good idea to draw up a rota of who is helping when, before the babies are born.
- Breastfeeding triplets - there are many ways to breastfeed triplets depending on what suits the mother and the babies. For example, mothers can breastfeed one after another, breastfeed two together and then one on their own, or breastfeed two and give expressed milk to the third. See ideas for rotations and feeding combination in the case studies below.
- Breastfeeding quads - again there are many ways to feed quads depending on what suits the mothers and the babies. See ideas for rotations and feeding combinations in the case studies below.
- Increased feeding due to growth spurts might be a tiring time for mother and babies while the mother's milk supply adjusts, especially if the co-siblings have growth spurts together. However, this will settle down after a couple of days.
- When stopping or reducing breastfeeding, this should be done gradually, otherwise the mother may be at risk of blocked ducts or mastitis. For example, try dropping one feed per day, let the breasts fully adjust, then try dropping another feed.

Expressed breastmilk:

- Some women find that they prefer to breastfeed two babies while someone else can give expressed breastmilk to the other baby(s).

Formula feeding:

- The formula used will depend on whether the babies are born prematurely and if so whether they are in hospital or at home (see section 2.11)

Combinations:

- Mothers of triplets and quads who want to breastfeed may choose to use a combination of breast and formula milk. Babies can be breastfed at first and bottles of formula introduced if the mother decides this is what she wants.

When considering different feeding options for triplets and quads, remember to take the following into account:

Special issues in triplets and quads:

- Support - a mother will need a lot of support in feeding and other aspects of care. How much support does the mother have from partner, family, friends, paid help, etc?
- Special care and bereavement - almost all triplets and quads are born preterm and require special care. Many have medical conditions and some will not survive (bereavement support should be given if appropriate). If a mother is grieving for one baby or anxious about the condition of another, this may affect her milk supply or her ability to breastfeed. On the other hand, breastfeeding may allow the mother to feel she is doing all she can to help her sick child and it may therefore take on an even greater importance for her.
- Records and diaries - most parents find it essential to write down details of every feed, at least in the early days e.g. which baby was breastfed (and on which side, for how long), how much expressed milk or formula was given. This enables parents and health professionals to make sure that all of the babies are being fed adequately and ensures that the feeding methods for the babies are rotated where appropriate (e.g. breastfed for one feed and bottle fed for the next feed). Parents may find this particularly useful for the night feeds, when both parents are particularly exhausted and it is easy to forget who got what.
- Storage - for babies receiving expressed breastmilk or formula in bottles, a lot of bottles and fridge space will be required.

Case studies of breastmilk feeding triplets and quads - how did they do it?

Detailed data are available from a Canadian study of nine mothers who fed their triplets breastmilk (*Leonard 2000*). Five women exclusively breastfed their triplets, one of these for six months. The remaining mothers did varying amounts of breastfeeding and pumping. Some of their experiences are summarised in the box below.

Experiences of 9 mothers who fed their triplets breastmilk

(*Leonard 2000*)

Frequency and duration of feeds

- Each mother fed approximately 18-27 times per 24 hour period.
- The average length of time it took to feed all three babies ranged between 45 minutes and 2 hours per feeding session.

Separate versus simultaneous feeding

- The majority preferred separate to simultaneous feeding, using the cradle hold because the mother wanted to devote attention to each baby individually.

Who gets which breast

- Some mothers offered one breast to the first baby, the other breast to the second, and both to the third. Women with abundant milk supplies found that the third baby was satisfied after just one breast.

Night feeding

- 2 Mothers breastfed one baby at night and pumped while the other 2 were given expressed breastmilk or formula by the father/carer.
- 1 mother did all night time (breast) feeding alone in a separate, dimly lit room.
- 1 mother fed all 3 at night while the father passed her the babies and helped with burping, changing nappies, etc.

Below are two case studies showing how mothers of triplets and quads have managed to feed their babies breastmilk (partially or exclusively).

CASE STUDY 1: Feeding triplets breastmilk (Storr 1989)

Background

- Gestation 32 weeks, caesarean
- 3 boys, bwt 3lb 4oz, 3lb 1oz, 2lb
- Mother determined to breastfeed.
- No other children.
- Husband at home in first month after discharge. Families came to stay in second month.

Establishing milk supply

- Mother expressed colostrum within first 24 hrs.
- Problems with low milk volume in first few days were resolved.
- Babies in SCBU for 35 days.
- Mother expressed at home 6 times per 24 hrs (every 3 hours in the day, sleeping at night).

Early feeding pattern - after discharge

Feed	Baby A	Baby B	Baby C	Pumping
1	Breast	Breast	Bottle*	Yes
2	Bottle	Breast	Breast	Yes
3	Breast	Bottle*	Breast	Yes
4	Breast	Breast	Bottle	Yes
5	Bottle*	Breast	Breast	Yes
6	Breast	Bottle	Breast	No

* all bottles contained expressed breastmilk

Long term feeding pattern

After a month at home, mother introduced one formula feed per day per baby, but stopped after a few days due to colic. Babies were then exclusively breastfed (usually separately): Baby A on left side, Baby B on right, Baby C on both sides (determined by which baby awakened first). All babies were breastfed for 12 months.

CASE STUDY 2: Feeding quads breastmilk (Auer 1998)

Background

- Gestation 31 weeks, caesarean
- 1 girl (bwt 1332 g), 3 boys (bwt 1403, 1588, 1644 g)
- Mother determined to breastfeed.
- One other child (age 9) who was breastfed for 2.5 years.

Establishing milk supply

- Mother pumped twice in first couple of days, then pumped 7-8 times per day from day 3-14.
- Low milk volume for many days and stress due to concerns about 2 babies.
- By day 14, milk volume =100cc per pumping session.

Early feeding pattern

All 4 received a mixture of breastfeeds, expressed milk and formula in hospital. This was the typical feeding pattern at home:

Feed	Baby A	Baby B	Baby C	Baby D
1	Breast	Breast	Bottle	Bottle
2	Bottle	Bottle	Breast	Breast
3	Breast	Bottle	Breast	Bottle
4	Bottle	Breast	Bottle	Breast
5	Breast	Breast	Bottle	Bottle
6	Bottle	Bottle	Bottle	Bottle

Mother rotated which ones were BF. All breastfeeds were topped off with 2-4 oz of formula. The mother pumped once before bedtime.

Long term feeding pattern

At 3.5 months, mother began exclusive breastfeeding (EBF) one baby due to sensitivity to formula. The other 3 were partially BF, receiving about $\frac{1}{3}$ to $\frac{1}{2}$ of all milk from the breast. The baby who was EBF abruptly stopped BF at 12 months. The other 3 BF 2-4 times per day until 30 months. Mother identified bonding and time spent with each individual baby as the most rewarding aspect of the BF experience.

Advice and support

Families with triplets or quads will need much advice and support in order to establish feeding routines and the everyday care their babies need once they are home. Practical help is essential for these families, but the kind of support needed may differ from family to family. Ideally, parents will need help not only in the day but also at night. This help should be organised in the antenatal period if possible. In addition to the health visitor, a social worker may need to be involved in the planning.

2.11 Meeting nutritional requirement in multiples

Multiples are unlikely to have different nutritional requirements than singletons of similar gestation and size for gestational age. Hence, the well grown twin or multiple born at term, to a mother with good nutritional status who has had optimum nutrition and weight gain throughout the pregnancy, is likely to have no increased nutritional requirements. However, this is unlikely to be the situation as many multiple pregnancies end prematurely and infants are small for gestational age. It is also widely acknowledged that infants born prematurely accrue substantial nutritional deficits during their period of neonatal intensive care (Embleton 2001) and this is likely to apply to a substantial number of multiple pregnancies. With appropriate attention to nutrition and growth monitoring throughout admission and after discharge, these deficits can be compensated.

Due to the lack of information on multiple pregnancies reported in the medical literature one must use as a baseline the current recommended intakes for infants born at term following a singleton pregnancy for those multiple pregnancies that reach term and possibly some of those 'near-term' (Department of Health 1991). Some recommended practice points for term or "near-term" multiples are shown in the box below.

Recommended practice points for term or "near-term" multiples [grade E]

No information in the literature for multiples, therefore this is based on current recommended intakes for term singletons.

Achieving nutritional needs:

- The best way of achieving nutritional needs is to encourage breastfeeding, or if this is not possible, to establish and maintain lactation and provide maternal expressed breastmilk until the infant can be exclusively breast fed.
- If adequate breastmilk is not available or the mother does not wish to breastfeed a range of infant formulas is available suitable for use from birth to one year.

Nutritional requirements will usually be met by:

- Allowing feeding to be baby led, or using the modified baby-led approach, both for breastfeeding (see Section 2.2) and formula feeding (see Section 2.7) multiples.
- Advice is usually given to parents who decide to bottle feed (formula and/or expressed breastmilk) on the amounts of milk and frequency of feeds likely to be needed, though a demand schedule is usually preferable to timed feeds (see Section 2.7).

Are the babies getting the correct amount of milk?

- A breastfed or formula fed baby is 'getting enough' milk if the baby is satisfied and growing.

Growth spurts

- Breastmilk is produced on a 'supply to meet demand' basis and in theory no demand is too great. However, it may take a day or two to stimulate the breasts to meet increased demands for growth spurts, particularly in multiples, and this can be a very tiring time for mother and babies.
- Realistic advice must be available to prevent hungry, fractious infants and tired demoralised parents. This should include information about normal patterns of feeding in babies as well as support to find methods to cope with meeting their babies' needs.
- Before considering supplementation or top-up with formula:
 - Explain how long you think it will take for the milk supply to catch up with the demand.
 - Explore the mother's goals with regard to breastfeeding. The earlier a formula supplement is given, the more the mother's milk supply may be compromised (see Section 2.8.1).

For multiple pregnancies producing infants born very prematurely, the guidelines that exist for preterm infants would be a good starting point [Tsang 2005, Agostini 2010]. The Agostini reference is published by the European Society for Paediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition (ESPGHAN) and may be downloaded at: http://espgan.med.up.pt/position_papers/Enteral_Nutrient_Supply_for_Preterm_Infants.pdf

Some recommended practice points for preterm multiples are shown in the box below.

Recommended practice points for preterm multiples [grade E] <i>Refer also to Section 2.3</i>	
<p>There is no information in the literature for multiples, therefore this is based on current recommended intakes for preterm singletons. Most feeding guidelines are for preterm babies who are admitted to the neonatal unit. Typically babies with:</p> <ul style="list-style-type: none"> • Gestation \leq 34 weeks • Birth weight $<$ 1800g or 2000g <p>Achieving nutritional needs:</p> <ul style="list-style-type: none"> • Tube feeding Most babies born prior to 34 weeks gestation are unlikely to have a mature feeding pattern sufficient to consume adequate quantities of milk without support, so tube feeding is very often the norm initially. • Recommended milk <ul style="list-style-type: none"> - Use of maternal expressed breastmilk (EBM) is recommended when feeding from the breast is not possible. - Where maternal EBM is not available some neonatal units have access to donor breastmilk in order to establish feeding until maternal supply meets demand. - Where neither maternal breastmilk nor donor breastmilk is available in sufficient quantities, a range of formulas is available to meet the increased needs of infants born preterm. These contain increased levels of nutrients in the amounts recommended to meet requirements in a volume likely to be well tolerated. • Fortification As the profile of maternal breastmilk is designed to meet the nutritional requirements of infants born at term many neonatal units supplement maternal EBM with specially designed breastmilk fortifiers that aim to increase the levels of nutrients thought to be required in higher amounts, to that required for optimum growth and nutrient accretion. A range of commercial multinutrient breastmilk fortifiers are available though some neonatal units have a modular approach adding individual nutrients to their own specifications. 	<p>Growth monitoring</p> <ul style="list-style-type: none"> • Growth is usually monitored closely on neonatal units with at least weekly weights and head circumference. Approaches to measuring growth in length vary from not at all to weekly. • When assessing growth in multiples, the babies should be treated as individuals rather than being directly compared with their co-sibling(s). <p>Transition feeding and discharge planning</p> <ul style="list-style-type: none"> • As time of discharge gets closer an individual feeding plan will be put together. It is important that this plan is put together early, it should be co-ordinated and multidisciplinary, preferably involving the breastfeeding specialist. Specialist support will be needed with a dedicated professional making the feeding plan. This could be a breastfeeding specialist, a neonatal community nurse or the generic neonatal nurse caring for the baby in conjunction with the wider team. • For babies having maternal EBM, a plan for a gradual transition to full breast feeding should be formulated. This is often a period of uncertainty as the baby transfers from total tube feeding using fortified breastmilk to exclusive breast feeding without any means of fortifying. The transition needs to be gradual and realistic, particularly for multiples. • For babies having only preterm formula while in hospital, the neonatal unit may introduce a nutrient enriched post discharge formula just prior to discharge. Preterm formula is only available in hospital. The post discharge formula will support the transition to feeding recommendations for infants born at term and should be continued until a period of catch up growth has been achieved. The duration of use varies across units, from not using them at all through to those who advise their use until 6 months corrected age (that is 6 months from the due date). The post discharge formula is available on prescription in the UK as a borderline substance for “catch-up growth in preterm infants - $<$35 weeks at birth - up to 6 months corrected age” and is available as a powder or in ready to feed cartons. The latter, though more expensive to prescribe are very useful in families with twins and multiple infants who are not breastfed.

Recommendations

3 Recommendations

3.1 Specialist training for health professionals on feeding multiples

For these Guidelines to be effectively implemented, education and training for all healthcare professionals concerned with the care of multiple birth families is essential. If professionals lack knowledge and skills, it is far less likely that mothers will be confident, especially with breastfeeding. As might be expected, the limited evidence suggests that educational interventions in a multi-disciplinary team can increase breastfeeding initiation rates (Renfrew 2009).

In “Multiple Pregnancy” (RCOG 2007) the consensus view of the expert group concluded that mothers have a need for specific information to include breastfeeding. In addition this should be an integral part of the management of multiple pregnancies within specialist clinics. Midwives and other healthcare staff should be trained to ensure this is provided.

The transition of care from midwives to health visitors and other staff in the community also requires appropriately trained staff, protocols and excellent communication. All relevant education programmes should have a component which trains staff to the appropriate level to comply with the services they will be providing. For example, midwifery, health visiting and courses for neonatal nurses. It is essential that there are sufficient numbers of staff in these areas.

3.2 Suggested content for breastfeeding workshops for parents

- Normal breastfeeding patterns of behaviour of babies
- Supply and demand
- Expressing breastmilk highlighting the importance of expressing if babies are not feeding
- Premature babies and transition to the breast
- Putting support into place before the births
- Developing breastfeeding friendly feeding patterns
- Babies as individuals

3.3 Auditable standards

Auditable standards for the monitoring of feeding should be developed.

3.4 Research recommendations

Further research is needed to explore reasons for the lower rates of breastfeeding in multiples compared with singletons, and to identify factors or interventions which would help initiate and sustain breastfeeding.

In subsequent UK Infant Feeding Surveys and other surveys of infant feeding, all multiples in the set (rather than just the first one) should be included.

4 Support groups and useful organisations

Multiple Births Organisations	Other Useful Organisations
<p>Multiple Births Foundation (MBF) Address: Hammersmith House, Level 4, Queen Charlotte's & Chelsea Hospital, Du Cane Rd, London W12 0HS Phone: 020 3313 3519 Fax: 020 8383 3041 Email: mbf@imperial.nhs.uk Website: www.multiplebirths.org.uk</p> <p>Twins and Multiple Births Association (Tamba) Address: 2 The Willows, Gardner Road, Guildford, Surrey GU1 4PG Phone: 01483 304442 Fax: 01483 304483 Email: enquiries@tamba.org.uk Website: www.tamba.org.uk Phone: 0800 138 0509 (Helpline) (10am-1pm, 7pm-10pm every day)</p>	<p>Baby Friendly Initiative (UNICEF UK Baby Friendly Initiative) Address: 30a Great Sutton Street, London EC1V 0DU Phone: 020 7375 6052 Email: bfi@unicef.org.uk Website: www.babyfriendly.org.uk</p> <p>Baby Milk Action Address: Baby Milk Action, 34 Trumpington Street, Cambridge, CB2 1QY Phone: 01223 464420 Email: info@babymilkaction.org Website: www.babymilkaction.org</p> <p>Bliss (The special care baby charity) Address: 9 Holyrood Street, London Bridge, London SE1 2EL Phone: 020 7 378 1122 Fax: 020 7 403 0673 Phone: 0500 618 140 (Helpline) (Mon-Fri, 9am - 9pm) Email: enquiries@bliss.org.uk Website: www.bliss.org.uk</p> <p>Home Start UK Address: 2 Salisbury Road, Leicester LE1 7QR Phone: 0800 068 6368 Fax: 0116 233 0232 Email: info@home-start.org.uk Website: www.home-start.org.uk</p> <p>United Kingdom Association for Milk Banking (UKAMB) Address: The Milk Bank, Queen Charlotte's & Chelsea Hospital, Du Cane Road London W12 0HS Phone: 020 3313 3559 Email: info@ukamb.org Website: www.ukamb.org</p>
Breastfeeding Support Groups	Other useful information
<p>Association of Breastfeeding Mothers Address: PO Box 207, Bridgewater TA6 7YT Phone: 08444 122 949 (Helpline) (9.30am-10.30pm every day) Email: counselling@abm.me.uk Website: www.abm.me.uk</p> <p>Breastfeeding Network Address: PO Box 11126, Paisley PA2 8YB Phone: 0300 100 0210 (Helpline) Email: email@breastfeedingnetwork.org.uk Website: www.breastfeedingnetwork.org.uk</p> <p>La Leche League (Great Britain) Address: PO Box 29, West Bridgford, Nottingham NG2 7NP Phone: 0845 456 1855 (General) Phone: 0845 120 2918 (Helpline) Website: www.lalcehe.org.uk</p> <p>National Breastfeeding Helpline Phone: 0300 100 0212 (Helpline) Websites: www.breastfeeding.nhs.uk www.nationalbreastfeedinghelpline.org.uk <i>The National Breastfeeding Helpline is a helpline run in collaboration with the Breastfeeding Network (BfN) and the Association of Breastfeeding Mothers (ABM).</i></p> <p>National Childbirth Trust (NCT) Address: Alexandra House, Oldham Terrace, London W3 6NH Phone: 0300 3300770 (General) Phone: 0300 330 0771 (Helpline) (8am-10pm, 7 days per week) Email: enquiries@nct.org.uk Website: www.nct.org.uk</p>	<p>The WHO/UNICEF recommends an international code of marketing of infant formula and other products used as breast-milk substitutes. Any information or materials given to parents should comply with this code. Details of the code may be downloaded at WHO (http://www.who.int/nutrition/publications/code_english.pdf).</p>

5 List of members of the Guideline Development Group

The guidelines were drafted by Maria Quigley and Jane Denton. The Guideline Development Group members are listed below:

Advisory Group	
Neena Modi (Chair)	Professor of Neonatal Medicine, Imperial College, London
Chloe Fisher	Retired Infant Feeding Specialist
Caroline King	Paediatric Dietitian (Neonatal Specialist), Imperial College Healthcare NHS Trust
Guideline Development Group	
Annie Aloysius	Senior Clinical Specialist Speech and Language Therapist, Queen Charlotte's and Chelsea Hospital, Imperial College Healthcare NHS Trust
Carolyn Basak	Adviser, Royal College of Nursing
Ruth Cockburn	Health Visitor, Hampshire PCT
Margie Davies	Midwifery Adviser, Multiple Births Foundation
Jane Denton (Chief Investigator)	Director, Multiple Births Foundation
Victoria Dugbartey	Infant Feeding Specialist Midwife, Queen Charlotte's and Chelsea Hospital, Imperial College Healthcare NHS Trust
Helga Everard	Specialist Midwife for Multiple Births, Queen Charlotte's and Chelsea Hospital, Imperial College Healthcare NHS Trust
Mary Fewtrell (Chair)	Reader in Childhood Nutrition and Honorary Consultant Paediatrician, Institute of Child Health, UCL
Chris Jarvis	Specialist Neonatal Dietitian, Nottingham University Hospitals
Elizabeth Jones	Senior Breastfeeding and Neonatal Research Practitioner, Neonatal Intensive Care Unit, University Hospital of North Staffordshire
Maria Quigley (Chief Investigator)	Reader in Statistical Epidemiology, National Perinatal Epidemiology Unit, University of Oxford
Keith Reed	Chief Executive, Twins and Multiple Births Association (Tamba)
Mary Renfrew	Professor of Mother and Infant Health and Director, Mother and Infant Research Unit, University of York
Janet Rimmer	Parent representative (mother of triplets)
Rosie Ticciati	Health Visitor and Counsellor, Multiple Births Foundation
Gillian Weaver	Milk Bank Manager and Chair, UK Association for Milk Banking, Imperial College Healthcare NHS Trust

Many thanks to the following for reviewing this publication:

- * Association of Breast Feeding Mothers
- * Baby Friendly
- * Bliss
- * Breastfeeding Network
- * British Association of Perinatal Medicine
- * British Dietetic Association
- * Imperial College Healthcare NHS Trust
- * Community Practitioners' and Health Visitors' Association
- * Department of Health for England
- * La Leche League
- * MPR Steering Group (North East)
- * National Childbirth Trust
- * National Perinatal Epidemiology Unit
- * Neonatal Nurses Association
- * Northern Survey of Twin and Multiple Pregnancy (NorSTAMP)
- * North West London Perinatal Network
- * Paediatric Section of the British Dietetic Association
- * Royal College of General Practitioners
- * Royal College of Midwives
- * Royal College of Nursing
- * Royal College of Obstetricians and Gynaecologists
- * Royal College of Paediatrics and Child Health
- * Twins and Multiple Births Association (Tamba)
- * UK Association of Human Milk Banking
- * UNICEF UK Baby Friendly Initiative (BFI)
- * United Kingdom Association for Milk Banking

6 List of abbreviations used in this guidance

BF	Breastfed/breastfeeding	NICU	Neonatal Intensive Care Unit
BM	Breastmilk	PTB	Preterm birth
BFI	Baby Friendly Initiative	RCT	Randomised Controlled Trial
EBF	Exclusively breastfed/exclusive breastfeeding	SCBU	Special Care Baby Unit
EBM	Expressed breastmilk	SES	Socio-economic status
HOM	Higher order multiples	SGA	Small for gestational age
LBW	Low birth weight infant	TPN	Total parenteral nutrition
LOS	Length of stay	VLBW	Very low birth weight
NEC	Necrotising enterocolitis	WHO	World Health Organisation
NICE	National Institute for Health and Clinical Excellence		

7 Glossary of terms and definitions used in this guidance

Term	Explanation
<i>Any / partial breastfeeding</i>	Some breastfeeding plus anything else e.g. water-based fluids, solids, other milk.
<i>Baby-led feeding</i>	When the timing and frequency of feeding is according to the baby's cues rather than a pre-specified timetable or routine.
<i>Breastmilk feeding</i>	Giving or receiving breastmilk direct from the breast, or receiving expressed breastmilk via a tube, cup or bottle.
<i>Complementary Feeding</i>	Used here to define introduction of "solid" foods into the diet (i.e. foods other than milk). Same as weaning.
<i>Co-siblings</i>	Siblings arising from the same multiple pregnancy.
<i>Donor breast milk</i>	Breast milk that is from a donor; in this guidance, it refers to breast milk from a milk bank.
<i>Exclusive breastfeeding</i>	Breastfeeding with no supplemental liquid or solid foods other than medications or vitamins. For babies in neonatal units, there are no current agreed definitions of exclusive breastfeeding (Renfrew 2009), in particular, there is no consensus on whether fortified breastmilk should be classified as partial or exclusive breastfeeding.
<i>Expressed breastmilk</i>	Breastmilk which the mother expresses from her breast, using her hands or a pump.
<i>Fore milk</i>	The low fat, higher volume breastmilk produced at the beginning of a breastfeed
<i>Formula milk feeding</i>	Giving or receiving cow's milk.
<i>Fortifier</i>	Protein, energy, vitamins and minerals which are added to (expressed) breastmilk with the aim of meeting preterm infants' specific nutritional needs.
<i>Galactagogue</i>	A substance that promotes lactation e.g. domperidone. Some herbs are cited as galactagogues e.g. fenugreek.
<i>Higher order multiples (HOM)</i>	Triplets, quads (quadruplets), quintuplets or sextuplets.
<i>Hind milk</i>	The high fat breastmilk produced after the foremilk.
<i>Let down reflex</i>	See milk ejection reflex.
<i>Low birth weight (LBW)</i>	Birth weight of <2500g.
<i>Milk ejection</i>	A reflex action that occurs in the breasts in response to the baby's sucking. When the baby sucks, the body produces oxytocin, which works on the muscle cells surrounding the milk storage sacs in the breast, causing them to contract. This pushes the milk into the ducts. Sometimes referred to as let down reflex.
<i>Mixed feeding</i>	Receiving breastmilk in combination with formula milk.
<i>Multiple birth</i>	More than one baby delivered from the same pregnancy e.g. twins, triplets, etc.
<i>NCT</i>	Formerly known as the National Childbirth Trust
<i>Parenteral feeding</i>	The partial or total intravenous provision of fluid and nutrients. Given when infants are unable to accept these via gastrointestinal route.
<i>Preterm birth (PTB)</i>	Gestation at birth <37 completed weeks.
<i>Weaning</i>	Used here to define introduction of "solid" foods into the diet (i.e. foods other than milk). Same as complementary feeding.
<i>Very low birth weight (VLBW)</i>	Birth weight of <1500g.

8 References

References for studies included in the systematic review

- Addy 1975** Addy HA. The breast-feeding of twins. *Journal of Tropical Pediatrics & Environmental Child Health* 1975;21(5):231-9.
- Antoniou 2005** Antoniou E, Daglas M, Iatrakis G, Kourounis G, Greatsas G. Factors associated with initiation and duration of breastfeeding in Greece. *Clinical & Experimental Obstetrics & Gynecology* 2005;32(1):37-40.
- Auer 1998** Auer C, Gromada KK. A case report of breastfeeding quadruplets: factors perceived as affecting breastfeeding. *Journal of Human Lactation* 1998;14(2):135-41.
- Berlin 2007** Berlin CM. "Exclusive" breastfeeding of quadruplets. *Breastfeeding Medicine: The Official Journal of the Academy of Breastfeeding Medicine* 2007;2(2):125-6.
- Biancuzzo 1994** Biancuzzo M. Breastfeeding preterm twins: a case report. *Birth* 1994;21(2):96-100.
- Blak 1986** Blak J, Jensen MK, Jensen KD, Overgaard D, Nielsen J. [Report from a group of mothers of twins]. *Sygeplejersken* 1986;86(2):18-20.
- Broadbent 1985** Broadbent B. Postnatal care. Twin trauma. *Nursing Times* 1985;81(32):28-30.
- Bryan 1983** Bryan E. Twins in the family. *Nursing Times* 1983;79(28):50-2.
- Butler 2004** Butler S, Williams M, Tukuitonga C, Paterson J. Factors associated with not breastfeeding exclusively among mothers of a cohort of Pacific infants in New Zealand. *New Zealand Medical Journal* 2004;117(1195):U908.
- Chen 1992** Chen Y. Factors associated with artificial feeding in Shanghai. *American Journal of Public Health* 1992;82(2):264-6.
- Colonna 1997** Colonna F, Cuttini M, Melon F, de Vonderweid U. [The success of maternal feeding with very low birth weight premature infants, singletons and twins: a 10-year experience]. *Pediatria Medica e Chirurgica* 1997;19(3):159-63.
- Damato 2005a** Damato EG, Dowling DA, Madigan EA, Thanattherakul C. Duration of breastfeeding for mothers of twins. *JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing* 2005;34(2):201-9.
- Damato 2005b** Damato EG, Dowling DA, Standing TS, Schuster SD. Explanation for cessation of breastfeeding in mothers of twins. *Journal of Human Lactation* 2005;21(3):296-304.
- Emsley 1994** Emsley A. Breast-feeding twins. *Midwives Chronicle* 1994;107(1276):178-81.
- Flacking 2003** Flacking R, Hedberg Nyqvist, Ewald U, Wallin L. Long-term duration of breastfeeding in Swedish low birth weight infants. *Journal of Human Lactation* 2003;19(2):157-165.
- Flidel-Rimon 2002** Flidel-Rimon O, Shinwell ES. Breast-feeding multiples. *Seminars in Neonatology* 2002;7(3):231-9.
- Flidel-Rimon 2006** Flidel-Rimon O, Shinwell ES. Breast feeding twins and high multiples. *Archives of Disease in Childhood Fetal & Neonatal Edition* 2006;91(5):F377-80.
- Ford 1994** Ford RP, Mitchell EA, Scragg R, Stewart AW, Taylor BJ, Allen EM. Factors adversely associated with breast feeding in New Zealand. *Journal of Paediatrics & Child Health* 1994;30(6):483-9.
- Geraghty 2004a** Geraghty SR, Pinney SM, Sethuraman G, Roy-Chaudhury A, Kalkwarf HJ. Breast milk feeding rates of mothers of multiples compared to mothers of singletons. *Ambulatory Pediatrics* 2004;4(3):226-31.
- Geraghty 2004b** Geraghty SR, Khoury JC, Kalkwarf HJ. Comparison of feeding among multiple birth infants. *Twin Research* 2004;7(6):542-7.
- Geraghty 2005** Geraghty SR, Khoury JC, Kalkwarf HJ. Human milk pumping rates of mothers of singletons and mothers of multiples. *Journal of Human Lactation* 2005;21(4):413-20.
- Gunn 2000** Gunn TR, Thompson JM, Jackson H, McKnight S, Buckthought G, Gunn AJ. Does early hospital discharge with home support of families with preterm infants affect breastfeeding success? A randomized trial. *Acta Paediatrica* 2000;89(11):1358-63.
- Hartmann 1984** Hartmann PE, Prosser CG. Physiological basis of longitudinal changes in human milk yield and composition. *Federation Proceedings* 1984;43(9):2448-53.
- Hattori 1999** Hattori R, Hattori H. Breastfeeding twins: guidelines for success. *Birth* 1999;26(1):37-42.
- Hill 2007** Hill PD, Aldag JC, Zinaman M, Chatterton RT. Predictors of preterm infant feeding methods and perceived insufficient milk supply at week 12 postpartum. *Journal of Human Lactation* 2007;23(1):32-8.
- Justesen 2000** Justesen A, Kunst A. Postneonatal and child mortality among twins in Southern and Eastern Africa. *International Journal of Epidemiology* 2000;29(4):678-83.
- Kaneko 2006** Kaneko A, Kancita Y, Yokoyama E, Miyake T, Harano S, Suzuki K, Ibuka E, Tsutsui T, Yuko Yamamoto, Ohida T. Factors associated with exclusive breast-feeding in Japan: for activities to support child-rearing with breast-feeding. *Journal of Epidemiology* 2006;16(2):57-63.
- Killersreiter 2001** Killersreiter B, Grimmer I, Buhner C, Dudenhausen JW, Obladen M. Early cessation of breast milk feeding in very low birthweight infants. *Early Human Development* 2001;60(3):193-205.
- King 2009** King C. An evidence based guide to weaning in preterm infants. *Paediatrics and Child Health* 2009;19:405-14.
- Langkamp 2006** Langkamp DL, Girardet RG. Primary care for twins and higher order multiples. *Current Problems in Pediatric and Adolescent Health Care* 2006;36(2):47-67.
- LaFleur 1996** LaFleur EA, Niesen KM. Breastfeeding conjoined twins. *JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing* 1996;25(3):241-4.
- Lau 2004** Lau C, Hurst N, Bums P, Schanler RJ. Interaction of stress and lactation differs between mothers of premature singletons and multiples. *Advances in Experimental Medicine & Biology* 2004;554:313-6.
- Lederman 2006** Lederman SA. Response to Geraghty et al regarding the use of pumps and breastfeeding [comment]. *Journal of Human Lactation* 2006;22(4):387.
- Leonard 1982** Leonard LG. Breastfeeding twins: maternal-infant nutrition. *JOGNN Nursing* 1982;11(3):148-53.
- Leonard 2000** Leonard LG. Breastfeeding triplets: the at-home experience. *Public Health Nursing* 2000;17(3):211-21.
- Leonard 2002a** Leonard LG. Breastfeeding higher order multiples: enhancing support during the postpartum hospitalization period. *Journal of Human Lactation* 2002;18(4):386-92.
- Leonard 2002b** Leonard LG. Breastfeeding rights of multiple birth families and guidelines for health professionals. *Twin Research* 2003;6(1):34-45.
- Leroen 1984** Leroen MV. [Breast feeding of twins in the hospital]. *Sygeplejersken* 1984;71(11):4-7.
- Liang 1997** Liang R, Gunn AJ, Gunn TR. Can preterm twins breast feed successfully?. *New Zealand Medical Journal* 1997;110(1045):209-12.
- McKenzie 2006** McKenzie PJ. The seeking of baby-feeding information by Canadian women pregnant with twins. *Midwifery* 2006;22(3):218-27.
- Mead 1992** Mead LJ, Chuffo R, Lawlor-Klean P, Meier PP. Breastfeeding success with preterm quadruplets. *JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing* 1992;21(3):221-7.
- Mikiel-Kostyra 2000** Mikiel-Kostyra K. [Breast feeding of twins with regard to pre-term infants]. *Ginekologia Polska* 2000;71(11):1406-9.
- Mikulska 2000** Mikulska M, Wolnicka B. [The significance breast feeding on the course of the adaptation period in neonates from multiple pregnancies]. *Ginekologia Polska* 2000;71(11):1410-6.
- Moore 2007** Moore JE. Multiple births: the art and science of caring for twins, triplets, and more. *Pediatrics in Review* 2007;28(3):e9-15.
- Neifert 1990** Neifert M, Thorpe J. Twins: family adjustment, parenting, and infant feeding in the fourth trimester. *Clinical Obstetrics & Gynecology* 1990;33(1):102-13.
- Nelson 2005** Nelson EA, Yu LM, Williams S. International Child Care Practices Study Group Members. International Child Care Practices study: breastfeeding and pacifier use. *Journal of Human Lactation* 2005;21(3):289-95.
- Norris 2002** Norris FJ, Larkin MS, Williams CM, Hampton SM, Morgan JB. Factors affecting the introduction of complementary foods in the preterm infant. *European Journal of Clinical Nutrition* 2002;56(5):448-54.
- Nyqvist 2002** Nyqvist KH. Breast-feeding in preterm twins: Development of feeding behavior and milk intake during hospital stay and related caregiving practices. *Journal of Pediatric Nursing* 2002;17(4):246-56.
- Ooki 2008** Ooki S. Breast-feeding rates and related maternal and infants' obstetric factors in Japanese twins. *Environ Health Prev Med* 2008;13:187-197.
- Ozcarar 2003** Ozcarar ZB, Sahin F, Beyazova U, Soysal S. Physical and mental development of Turkish twins. *Pediatrics International* 2003;45(6):712-8.
- Pector 2004** Pector EA. How bereaved multiple-birth parents cope with hospitalization, homecoming, disposition for deceased, and attachment to survivors. *Journal of Perinatology* 2004;24(11):714-22.

References

- Rozas 2000** Rozas MR, Costa J, Cambredo MV, Colome N, Bravo MT, Grau M. [Breast feeding and birth of twins]. *Atencion Primaria* 2000;26(4):224-30.
- Saint 1986** Saint L, Maggiore P, Hartmann PE. Yield and nutrient content of milk in eight women breast-feeding twins and one woman breast-feeding triplets. *British Journal of Nutrition* 1986;56(1):49-58.
- Sollid 1989** Sollid DT, Evans BT, McClowry SG, Garrett A. Breastfeeding multiples. *Journal of Perinatal & Neonatal Nursing* 1989;3(1):46-65.
- Spiro 1992** Spiro A. Supporting parents who wish to breastfeed twins. *Health Visitor* 1992;65(6):197-8.
- Stables 1980** Stables J. Breastfeeding twins. *Nursing Times* 1980;76(34):1493-4.
- Storr 1989** Storr GB. Breastfeeding premature triplets: one woman's experience. *Journal of Human Lactation* 1989;5(2):74-7.
- Szucs 2009** Szucs KA, Axline SE, Rosenman MB. Quintuplets and a mother's determination to provide human milk: it takes a village to raise a baby - how about five? *Journal of Human Lactation* 2009;25(1):79-94.
- Thome 2006** Thome M, Alder EM, Ramel A. A population-based study of exclusive breastfeeding in Icelandic women: is there a relationship with depressive symptoms and parenting stress? *International Journal of Nursing Studies* 2006;43(1):11-20.
- Thorpe 2003** Thorpe K, Rutter M, Greenwood R. Twins as a natural experiment to study the causes of mild language delay: II: Family interaction risk factors. *Journal of Child Psychology & Psychiatry & Allied Disciplines* 2003;44(3):342-55.
- Wooldridge 2003** Wooldridge J, Hall WA. Posthospitalization breastfeeding patterns of moderately preterm infants. *Journal of Perinatal & Neonatal Nursing* 2003;17(1):50-64.
- Yokoyama 2004** Yokoyama Y, Ooki S. Breast-feeding and bottle-feeding of twins, triplets and higher order multiple births. *Nippon Koshu Eisei Zasshi - Japanese Journal of Public Health* 2004;51(11):969-74.
- Yokoyama 2006** Yokoyama Y, Wada S, Sugimoto M, Katayama M, Saito M, Sono J. Breastfeeding rates among singletons, twins and triplets in Japan: A population-based study. *Twin Research & Human Genetics: the Official Journal of the International Society for Twin Studies* 2006;9(2):298-302.

Additional References - suitable for health professionals

- Agostoni 2010** Agostoni C, Buonocore G, Carnielli VP et al. Enteral Nutrient Supply for Preterm Infants: Commentary from the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition Committee on Nutrition. *J Pediatr Gastroenterol Nutr* 2010;50:1-9. (http://espgan.med.up.pt/position_papers/Enteral_Nutrient_Supply_for_Preterm_Infants.pdf)
- Becker 2008** Becker GE, McCormick FM, Renfrew MJ. Methods of milk expression for lactating women. *Cochrane Database Syst Rev* 2008; (4): CD006170.
- Colson 2005** Colson S. Maternal breastfeeding positions: Have we got it right? (2) *The Practising Midwife* , 2005,8:11:29-32.
- Department of Health** Department of Health, Dietary Reference Values of Food Energy and Nutrients for the United Kingdom. Report on Health & Social Subjects No. 41, in HMSO 1991.
- Embleton 2001** Embleton NE, Pang N, Cooke RJ. Postnatal Malnutrition and Growth Retardation: An Inevitable Consequence of Current Recommendations in Preterm Infants? *Pediatrics* 2001;107(2):270-273.
- ESPGAN 1987** ESPGAN, Nutrition and Feeding of Preterm Infants. *Acta Paediatrica Scandinavica - Supplement* 1987; 336:1-14.
- FSA/BDA 2007** FSA/BDA. Guidelines for making up special feeds for infants and children in hospital, 2007. (<http://www.food.gov.uk/multimedia/pdfs/publication/babypowdertoolkit1007>)
- Ip 2007** Ip S, Chung M, Raman G, Chew P, Magula N, DeVine D, Trikalinos T, Lau J. Breastfeeding and Maternal and Infant Health Outcomes in Developed Countries. Evidence Report/Technology Assessment No. 153. AHRQ Publication No. 07-E007. Rockville, MD: Agency for Healthcare Research and Quality. April 2007.
- Jones 2005** Jones E and King C (eds). Feeding and nutrition in the preterm infant. Edinburgh: Elsevier / Churchill Livingstone 2005.

- Kuzma-O'Reilly 2003** Kuzma-O'Reilly B, Duenas ML, Greecher C, Kimberlin L, Muijsce D, Miller D, Walker DJ. Evaluation, Development, and Implementation of Potentially Better Practices in Neonatal Intensive Care Nutrition. *Pediatrics* 2003;111:e461-470.
- Lawrence 1999** Lawrence RA, Lawrence RM. Breastfeeding. A guide for the medical profession. Mosby, Inc 1999.
- Leonard 2006** Leonard Linda. Breastfeeding multiples (British Columbia Reproductive Care Program). (<http://www.bcph.ca/sites/bcrep/files/Guidelines/General/Gen3CBreastfeedingMultiplesNovember2006.pdf>)
- McNally 2008** McNally S, Napier K, Welford H. Introducing the NCT information sheet: what's in a nappy? *Simpsons NCT* 2008.
- Moore 2007** Moore ER, Anderson GC, Bergman N. Early skin-to-skin contact for mothers and their healthy newborn infants. *Cochrane Database of Systematic Reviews* 2007, Issue 3. Art.No.:CD003519. DOI: 10.1002/14651858.CD003519.pub2.
- NICE 2005** NICE Interventional procedure guidance 149, Division of ankyloglossia (tongue-tie) for breastfeeding. NICE 2005.
- NICE 2008** NICE public health guidance 11, Improving the nutrition of pregnant and breastfeeding mothers and children in low-income households. NICE 2008.
- Patole 2005** Patole SK, de Klerk N. Impact of standardised feeding regimens on incidence of neonatal necrotising enterocolitis: a systematic review and meta-analysis of observational studies. *Arch. Dis. Child. Fetal Neonatal Ed* 2005;90:F147-151.
- Petrie 1995** Petrie, GJ, Barnwell E, Grimshaw J, on behalf of the Scottish Intercollegiate Guidelines Network. Clinical guidelines: criteria for appraisal for national use. Edinburgh: Royal College of Physicians, 1995.
- Quigley 2007a** Quigley MA, Kelly YJ, Sacker A. Breastfeeding and hospitalization for diarrheal and respiratory infection in the UK Millennium Cohort Study. *Pediatrics* 2007, 119: e837-842.
- Quigley 2007b** Quigley MA, Henderson G, Anthony MY, McGuire W. Formula milk versus donor breast milk for feeding preterm or low birth weight infants. *Cochrane Database Syst Rev* 2007; (4): CD002971.

- RCOG 2007** RCOG Consensus views arising from the 50th Study Group: Multiple Pregnancy Consensus expert, RCOG 2007.
- Renfrew 2009** Renfrew MJ, Craig D, Dyson L, McCormick F, Rice S, King SE, Misso K, Stenhouse E, Williams AF. Breastfeeding promotion for infants in neonatal units - a systematic review and economic analysis. NIHR HTA 2009.
- SIGN 2009** Scottish Intercollegiate Guidance Network SIGN 50: A guideline developer's handbook (<http://www.sign.ac.uk/guidelines/fulltext/50/annexb.html>).
- Spencer 2009** Spencer SA, Jones E, Hartmann P, Morgan C. 2009. Breastfeeding [CD-ROM]. UK: OCB Media Ltd. ISBN 1-904039-66-9.
- Tsang 2005** Tsang R et al. Nutrition of the Preterm Infant: Scientific Basis and Practical Guidelines 2nd Ed. 2005: Digital Educational Publishing Inc.

Additional References - suitable for parents

- Association of Breastfeeding Mothers** Breastfeeding twins. (www.abm.me.uk/sites/default/files/Breastfeeding%20Twins.pdf)
- Department of Health 2007** Department of Health. Off to the best start. 2007, Department of Health.
- Gromada 2007** Gromada Karen Kerkhoff. Mother multiples: Breastfeeding and caring for twins or more. La Leche League International, 3rd Edition 2007.
- Jones 2009** Jones E, Spencer A. Breastfeeding your premature baby. Bliss - the premature baby charity, 6th Edition 2009.
- La Leche League International 2009** Tips for breastfeeding twins - pad of 50. La Leche League International, 3rd Edition 2009.
- Meier** Meier Paula. Breastfeeding multiple babies. (<http://abbottnutrition.com/resources/en-US/home/breastfeeding/Breastfeeding%20Multiples.pdf>)
- MBF** Multiple Births Foundation. Feeding twins, triplets and more. Multiple Births Foundation, 3rd Edition, 2004.
- Tamba** Tamba. Supporting mothers breastfeeding more than one. Twins and Multiple Births Association (www.tamba.org.uk)

*Guidance for Health Professionals on Feeding Twins,
Triplets and Higher Order Multiples*

THE MULTIPLE BIRTHS FOUNDATION



www.multiplebirths.org.uk

Registered Charity no: 1094546