Formula feeds

RCN guidance for nurses caring for infants and mothers
Acknowledgements

The Royal College of Nursing would like to thank Doreen Crawford (Chair) and Lorraine Tinker (member) of the RCN Children and Young People’s Acute Care Forum for reviewing and updating this publication.

This publication is due for review in November 2015. To provide feedback on its contents or on your experience of using the publication, please email publications.feedback@rcn.org.uk

RCN Legal Disclaimer

This publication contains information, advice and guidance to help members of the RCN. It is intended for use within the UK but readers are advised that practices may vary in each country and outside the UK.

The information in this publication has been compiled from professional sources, but its accuracy is not guaranteed. Whilst every effort has been made to ensure the RCN provides accurate and expert information and guidance, it is impossible to predict all the circumstances in which it may be used. Accordingly, to the extent permitted by law, the RCN shall not be liable to any person or entity with respect to any loss or damage caused or alleged to be caused directly or indirectly by what is contained in or left out of this information and guidance.

Published by the Royal College of Nursing, 20 Cavendish Square, London, W1G 0RN

© 2013 Royal College of Nursing. All rights reserved. Other than as permitted by law 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 prior permission of the Publishers or a Licence permitting restricted copying issued by the Copyright Licensing Agency, Saffron House, 6-10 Kirby Street, London EC1N 8TS. This publication may not be lent, resold, hired out or otherwise disposed of by ways of trade in any form of binding or cover other than that in which it is published, without the prior consent of the Publishers.
Introduction

The RCN unequivocally endorses the recommendations from the World Health Organization (WHO, 2003) that exclusive breastfeeding is the optimal means of infant feeding for the first six months of an infant’s life. For the majority of infants, breastmilk is the perfect first food. A growing volume of evidence suggests that infants who are not breastfed are more likely to develop a range of diseases and conditions across their life course (Robinson and Fall, 2012, Stuebe, 2009).

The following examples are indicative of the benefits of breastfeeding but are not an exhaustive review of the literature. Breastfed infants have fewer infections, this includes lower respiratory tract infection, gastrointestinal infection, and otitis media and they also have a reduced risk of obesity, which can lead to diabetes which is becoming an increasing burden on the NHS (Oddy 2012, Fisk, Crozier, Inskip, et al 2011, Horta, Bahl, Martines et al, 2007, Quigley, Kelly and Sacker et al, 2007, Owen, Marin, Whincup et al 2005, Kramer, Chalmers, Hodnett et al 2001). Pre-term infants who are not breastfed or who do not receive breastmilk are more likely to develop necrotising enterocolitis (Henderson, Craig, Brocklehurst et al., 2009).

There are some indications that breastfeeding influences a child’s cognitive development (Kramer, Aboud, Mironoova, 2008). The benefits are not only for infants; mothers who breastfeed are less likely to develop breast cancer (do Carmo Franca-Botelho, Ferreira, Franca et al., 2012, Ip, Chung, Raman et al., 2007) and also have a reduced risk of developing ovarian cancer (Jordan, Cushing-Haugen and Wicklund, 2012). Breastfeeding is such an important indicator of health that it has been included in the Public Health Outcomes Framework for England (Department of Health, 2012b).
The evidence

The Infant Feeding Survey is conducted every five years. The 2010 Infant Feeding Survey (DH, 2012a) demonstrated that 81 per cent of mothers initiated breastfeeding their infants. However, the prevalence fell to 69 per cent at one week and by six months only 34 per cent were still breastfeeding. As a consequence, infant formula is an important source of nutrition for many infants. To feed formula successfully parents need education and support to ensure their infants safety. Nurses, as respected professionals, are ideally placed to help and support families in making choices and advising on safe formula feeding.

While nurses should continue to provide advice and promote and support breastfeeding, they should also be able to advise parents and help with formula feeding. Nurses need to have knowledge and skill on the safe preparation and storage of formula, and without bias or the promotion of any brands, have knowledge of the different formulas available.

Nurses are reminded that if they work in an area that has Baby Friendly status, or their employer is seeking Baby Friendly status, then they must ensure that there are no adverts for formula milk, bottles, teats or solid food for infants under six months old for mothers or their families, as stipulated by the International Code of Marketing of Breastmilk Substitutes, (WHO, 1981). They should also consider that the use of branded gifts with familiar logos in front of mothers may carry a subtle message that the professional endorses the product.

This publication uses a Q&A format to give nurses who are caring for infants and their mothers, whether in hospital or community settings, some basic information to enable safe formula feeding.
Questions and answers

Why are some infants given formula feeds?

There are many reasons why mothers stop breastfeeding before they might have wished to and these include:

- a lack of support
- concerns about maternal or child health (infant nutrition, maternal illness or the need for medicine, and infant illness)
- concerns about the processes associated with breastfeeding specifically lactation and milk-pumping problems (Odom, Li, Scanlan et al., 2013).

Some parents choose to introduce formula feeds either exclusively, or in addition to breastfeeding, perhaps as a result of returning to work; although supporting the mother at study or work may prolong breastfeeding (UNICEF, 2008). Parents have a right to choose how to feed their baby and a nurse’s knowledge of different formulas can help families to make a suitable choice.

Infant factors in feeding decisions may include some inborn errors of metabolism; sucking difficulties and prematurity where there is insufficient breast milk or the breast milk contains insufficient calories for growth (although special ‘fortifiers’ can be added to expressed breast milk). Maternal factors can make formula feeding desirable, for example, the age of the mother can influence feeding decisions (Dyson, Green, Renfrew et al., 2010) pharmacotherapy; maternal ill health; infectious or transmissible diseases (to prevent the transmission of HIV infection during the postpartum period) may all be considerations. The British HIV Association and Children’s HIV Association (BHIVA/CHIVA) continues to recommend the complete avoidance of breastfeeding for infants born to HIV-infected mothers, regardless of maternal disease status, viral load or treatment (Taylor, Anderson, Claydon et al., 2011). Nurses who work abroad should refer to the specific guidelines produced by the World Health Organization (WHO, 2010a).

Breastfeeding can also be contraindicated where the mother is a substance user and also poses challenges to mothers who have mental health problems (Gagliardi, Petrozzi and Rusconi, 2012). The Twins and Multiple Birth Association is concerned about the fact that twins are more likely to be artificially fed than single babies. It is
possible to successfully breastfeed twins and triplets but some mums choose to supplement with formula when the pregnancy has resulted in multiple births.

**How does the Nursing and Midwifery Council (NMC) Code of Professional Conduct: standards for conduct, performance and ethics (2008) relate to formula feeding?**

The NMC code makes it clear that nurses are:

- accountable
- must always act in the best interests of their patients/clients
- keep their skills and knowledge up to date
- provide evidence-based care.

It also makes it clear that individuals must be respected, so if a mother chooses the formula infant feeding method, nurses should not be judgemental or allow personal beliefs to influence the care, support and information they give (NMC, 2008).

**What does the Baby Friendly Initiative say about formula feeding?**

The World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) UK Baby Friendly Initiative informs parents that if they decide not to breastfeed, staff will support them. Staff will ask if they would like to be taught how to make up a bottle properly and be able to answer any questions (UNICEF UK, Baby Friendly, 2007).

**How do mothers who use formula milk feel?**

It is a public health promotion responsibility of health professionals to ensure expectant mothers are given information in order to make informed decisions. In doing so it is important that mothers are informed during pregnancy about the benefits of breastfeeding and the risks of artificial feeding. Should the mother choose to bottle feed then she should be given every support to do so, as safely as possible, in a non-judgemental way. Due to the overwhelming evidence and emphasis on the benefits of breastfeeding, mothers who use formula milk can feel that they have failed (Lee and Furedi, 2005). Hoddinott, Craig, Britten et al. (2011) investigated the perspectives of women and their wider family and social networks on infant feeding.
from pregnancy until six months after birth and identified a clash between idealism and realism.

**What could happen if mothers don’t get the information they need about bottle feeding?**

Inadequate or inaccurate information may result in a range of serious risks to infant health. Unhygienic preparation of equipment, reconstitution, storage and administration of feeds may result in a risk of infection, dehydration, malnutrition and hypernatraemia.

**Are formula feeds nutritionally safe?**

Modern formulas have been developed to high nutritional standards and the composition of artificial feeding milks and powders must comply with European regulations. Many scientifically validated formulas are available in the UK to meet the needs of normal healthy infants and those with special dietary needs. Although infants grow and develop on formula feeds, they do not replicate all the nutritional factors found in breast milk.

**Which formula should be used when caring for infants in hospital?**

When caring for a formula-fed infant, nurses should aim to continue to use the same feed as at home, unless this is medically contraindicated. When cost and turnover influences the type of feed that may be stocked on a ward, any change in formula should be with the mother’s consent and, where possible, the advice of a paediatric dietician.

**What are the differences between formulas?**

There are subtle differences between types and brands of formulas. Nurses need to be aware of these differences so that accurate advice can be given to parents. All the main formulas are modified from cows’ milk. It is important to be familiar with the available brands (featured in the table on the next page) so that, if invitations are received or promotional material offered, the professional is clear on how they are connected with the makers of infant formula (UNICEF, 2013).
The main brands of infant formula in the UK and their parent companies*

<table>
<thead>
<tr>
<th>Brand</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aptamil</td>
<td>Nutricia/Danone</td>
</tr>
<tr>
<td>Cow and Gate</td>
<td>Nutricia/Danone</td>
</tr>
<tr>
<td>SMA</td>
<td>Nestle</td>
</tr>
<tr>
<td>Hipp Organic</td>
<td>Hipp</td>
</tr>
<tr>
<td>Enfamil</td>
<td>Mead Johnson</td>
</tr>
<tr>
<td>Babynat</td>
<td>Vitagermine</td>
</tr>
<tr>
<td>Alpro</td>
<td>Alpro</td>
</tr>
<tr>
<td>Holle</td>
<td>Ulula</td>
</tr>
</tbody>
</table>

*accurate at October 2013

**Infant formula** – whey based or first stage infant formulas are regarded as having a protein profile closer to that of breast milk than cows’ milk. They can be used when moving from breastfeeding to bottle feeding, or to complement breastfeeding. They are easily digestible and may contain long chain polyunsaturated fatty acids and nucleotides to support healthy growth and development. Some infant formulas have an alphalactalbumin enriched whey protein profile that is closer to that of human milk. Some also contain prebiotics to encourage the growth of friendly gut bacteria. Casein based second stage formulas have a composition closer to cows’ milk. Formulas with higher casein content and a lower whey/casein ratio (20:80) are often marketed for “hungry” infants. This is probably because it was thought that the curd formed by the higher casein level slowed gastric emptying. There is little evidence to support the use of these formulas and they are generally not recommended by UNICEF (2010). The molecular structure of the feed can influence the speed of an infant’s digestion in some situations (Staelens, Van Den Driessche, Barclay et al., 2008).

Either of these types of formula milk can provide the sole source of nutrition up to six months of age, but the whey-based first stage formulas have a better balance of essential amino acids and this should be brought to the attention of mothers choosing to use formula.

**Follow-on formulas** – have higher levels of protein, iron and other nutrients than those designed to be given from birth. They can be used from six months of age and as part of a weaning diet. Follow on formula is not regarded as a breast milk.
substitute and is not regulated by the same advertising restrictions. WHO (1986) stated that they were not necessary, as breastmilk should continue to be a substantial part of a weaning infant’s diet. However, for mothers who choose to use them and seek advice from a nurse, they are reconstituted in the same way as first feeds.

**Specialist formulas** – are available on prescription for infants with specific requirements, for example, faltering growth, prematurity, food allergic disease and metabolic disorders. A paediatric dietician should advise on their use and reconstitution should follow the manufacturer’s instructions.

**Other formulas**

Infant formula milks based on goat or sheep milk protein are not sold in the UK. Infant milks based on goat milk protein for infants less than one year old are not recommended (NHS, 2012b). The Scientific Advisory Committee on Nutrition (SACN, 2008) has advised that there is no particular health benefit associated with the consumption of soya-based infant formula for infants who are sensitive to cow-based formula – more appropriate hydrolysed protein formulas are available and can be prescribed.

Good night milk drinks are described as being thicker – one manufacturer states that they are a milk-based meal of follow-on milk with added cereals. The products differ from typical infant formulas and follow-on formulas in that they have added ingredients such as pre-gelatinised rice flour or flakes, wholegrain oatmeal and potato or corn starch combinations which make the drink more viscous than other formula milks. SACN (2008) has not identified evidence that the use of these milks offer any nutritional or health advantage over the use of infant formula among infants artificially fed.

Infant formula powder is not sterile and may contain micro-organisms, such as Enterobacter sakazakii and salmonella, although infection from these is rare. Premature infants are likely to be more susceptible to these organisms than older infants, and it is recommended that premature and low birth weight infants should be given liquid ready-to-feed formula instead, as this is sterile. It is essential to recommend good hygiene practices are followed – reading and following the manufacturer’s guidance and adherence to local policies will reduce the risks. Detailed guidance on preparing feeds is available from the Department of Health (2013) and the same guidance applies to all of the UK population.
How should equipment be cleaned and sterilised and formula be prepared and stored?

It is vital that all equipment used for feeding and preparing feeds has been thoroughly cleaned and sterilised before use.

• Hands must be thoroughly cleaned before touching sterilising or feeding equipment.

• The feeding equipment and the preparation equipment must be thoroughly washed in hot soapy water.

• Bottle and teat brushes should be used to scrub inside and outside of bottles and teats to ensure that all remaining feed residue is removed.

• After washing feeding equipment rinse it thoroughly under the tap.

• If using chemical or a commercial steriliser, follow manufacturer’s instructions.

• It is best to remove the bottles from the steriliser just before they are used. If the bottles are not being used immediately, they should be fully assembled with the teat and lid in place to prevent the inside of the sterilised bottle and the inside and outside of the teat from being contaminated (NHS Choices, 2012a).

Preparing a feed using powdered infant formula

Normally each bottle should be made up fresh for each feed. Storing made-up formula milk may increase the chance of a baby becoming ill and should be avoided.

• Clean the surface thoroughly on which to prepare the feed.

• Wash hands with soap and water and then dry.

• Boil fresh tap water in a kettle. Alternatively bottled water that is suitable for infants (low sodium less than 200mg per litre and sulphate less than 250 mg per litre) can be used for making up feeds but should be boiled in the same way as tap water.

• Allow the boiled water to cool to no less than 70º C. This means in practice using water that has been left covered, for less than 30 minutes after boiling.

• Pour the amount of boiled water required into the sterilised bottle.

• Add the exact amount of formula powder as instructed by the manufacturers on the label do not add more or less powder as this constitutes a risk to the infant.
• Reassemble the bottle keeping the teat contained within the bottle cap and shake gently until its content is mixed.

• The contents can be cooled to a feeding temperature by holding the lower part of the bottle under a running tap ensuring that the tap water does not come into contact with the cap.

• Check the temperature before giving it to the baby – the temperature should be lukewarm, not hot.

• Discard any feed that has not been used within two hours of preparation, if in a hospital environment it should be discarded as soon as the baby has fed.

(NHS Choices, 2010, NHS, 2012b)

Where making individual feeds is not possible or practical, the feeds should be prepared in separate bottles and stored in a fridge at a temperature below 5ºC for no more than 24 hours. Remove from the fridge just before needed and then warm in a bottle warmer or with warm water. Do not use a microwave.

How much feed should be given?

As a guide, for a full term baby receiving all its nutrition from a feed, the fluid requirement from about one week to three months is 150 ml/kg body weight. Newborn infants gradually increase their intake from about 20-30 ml/kg on the first day of life to 150 ml/kg by seven days (Dixon, Crawford, Teasdale et al., 2009). This reflects the increase in the capacity of the infant’s stomach.

The containers of formula powder show tables of the typical volume to use based on the age and weight of the infant. Whenever possible, home routines should be continued in hospital. Infants should be fed on demand if their condition allows this and offered the amount required to satisfy their hunger and growth needs. There is individual variation, however, most term infants will initially need to be fed every two to four hours, day and night. If a parent is at all concerned, they should be advised to seek advice from a health care professional.

Should water be given in hot weather?

Completely breast-fed infants should not be given water until after they have started eating solid food. Infants fed on formula milk should be offered extra drinks of freshly boiled and cooled water in very hot weather (NHS Choices, 2011).
When should weaning begin?
The recommended age for solid foods to be introduced is about six months old. However, breastfeeding and/or formula should continue after six months, in addition to solid foods. Cows’ milk should not be used as a main drink until after 12 months of age. Mothers who are unable, or choose not, to follow these recommendations should be supported to optimise their infant’s nutrition.

Where can I find out more?
Midwives, health visitors and specialist community public health nurses have specific expertise in infant feeding. They can assist in giving optimum care to a particular infant, and support to the mother. Similarly, a paediatric dietician will be able to give advice on breastfeeding, formula feeding and weaning.

Advice, guidance and further information is also available from these websites:

• Baby Friendly Initiative – www.babyfriendly.org.uk (this includes sections on latest news, research and training)
• Breastfeeding at study or work – www.unicef.org.uk
• Department of Health – www.dh.gov.uk
• Food Standards Agency – www.food.gov.uk (this includes sections on safety, hygiene and nutrition)
• Nursing and Midwifery Council – www.nmc-uk.org
• Breastfeeding Twins and multiple birth babies – www.tamba.org.uk
• Start4life leaflets – www.nhs.uk/start4life
• Best Beginnings – www.bestbeginnings.org.uk
• UNICEF formula guidance – www.unicef.org.uk/formulaguide
• Infant Milks in the UK (First Steps Nutrition Trust) – www.firststepsnutrition.org
**What is the RCN’s position on infant feeding?**

The RCN believes breastfeeding gives infants the best start in life, providing them with the optimal source of nourishment. The RCN strives for a society where:

- women feel enabled to initiate and continue breastfeeding as long as they wish
- parents are supported to make informed choices about feeding their infants
- everyone is aware of the significant benefits associated with breastfeeding.

To learn more about the RCN’s commitment to breastfeeding and participation in initiatives please log on to [www.rcn.org.uk](http://www.rcn.org.uk)
References


The RCN represents nurses and nursing, promotes excellence in practice and shapes health policies.

Second edition, November 2013
Review date November 2015

RCN Online
www.rcn.org.uk

RCN Direct
www.rcn.org.uk/direct
0345 772 6100

Published by the Royal College of Nursing
20 Cavendish Square
London
W1G 0RN

020 7409 3333

www.facebook.com/royalcollegeofnursing
www.twitter.com/thercn
www.youtube.com/rcnonline

Publication code: 003 137

ISBN: 978-1-908782-96-0