Formula feeds

RCN guidance for nurses caring for infants and mothers

Introduction

This publication aims to provide an overview of formula feeding to enable health professionals to support mothers who, for whatever reason, have made this choice of feeding. It provides basic information to enable safe formula feeding, whether in hospital or community settings, and details the different types of both standard formula, and formula adapted for minor gastro conditions, that are widely available in the UK. The scope of the guidance is restricted to formula feeds suitable during the rst year of life.

It outlines the legislation which governs the composition, advertising and labelling of formula milks. It also provides a summary of formula suitable for pre-term, allergy and faltering growth. Rarer clinical conditions, such as inborn errors of metabolism and kidney disease, are beyond its scope. Feeding guidelines, and an introduction to tube feeding, has also been provided.

This publication's target audience includes children's nurses, neonatal nurses, adult nurses, midwives, health visitors and health care support workers. The bene ts of breastfeeding are unquestionable and this guidance takes this as its starting point.

RCN position on formula feeding

The RCN unequivocally endorses the current recommendations of the World Health Organization (WHO) that exclusive breastfeeding is the optimal means of feeding for the rst six months of an infant's life. For the majority of infants, breastmilk is the perfect rst food.

The NMC Code (2015) makes it clear that nurses can interpret the values and principles set out in the Code in a range of different practice settings, but make clear that the standards are not negotiable or discretionary. The NMC states cl that the 2015 Code signi es what good nursing and midwifery practice looks lik advocates that the interests of patients and service users are put rst. Nurses m ensure that care is safe and effective and, as professionals, promote trust thro their actions. When considering infant feeding, the best interests of the family to be considered and when mothers choose to feed formula they should be tre with respect; these families need to have their rights and choices upheld and a discriminatory attitudes and behaviours must be challenged.

The Code makes no reference to formula feeding but does require professiona behaviour with regards to accepting gifts, hospitality and calls for nancial inte The Code also cautions registrants that their professional status should never used to propose causes that are not related to health. When interpreting the C relation to the practicalities of infant feeding, the registrant and health care professional should be mindful of the United Nations International Children's Emergency Fund (UNICEF) guidance on the importance of working within

Benefits of breastfeeding

Breastfeeding is how nature intended babies to be fed and it is undisputedly the best way to feed a baby. The WHO and UNICEF recommend that a baby is exclusively breastfed for the rst six months of life, and that breastfeeding should continue,

- (ORMONES
- 'ROWTH FACTORS
- %NZYMES
- (UMAN MILK OLIGOSACCHARIDES
- !NTI MICROBIAL

Infant feeding in the UK

Since 1975, the UK Infant Feeding Survey has been conducted every five years. The 2010 Infant Feeding Survey (IFS) (HSCIC, 2012) demonstrated that 81% of mothers initiated breastfeeding their infants; however the prevalence fell to 69% at one week and by six months only 34% 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 infant's safety. As respected professionals, nurses are ideally placed to help and support families in making their choices and advising as to safe formula feeding.

While nurses should continue to provide advice and to promote and support breastfeeding, they should also be able to advise parents and help with formula feeding. Whilst recognising that breastfeeding is the preferred option for feeding an

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urses need to havakaolind skill with rer.7(d t)2.7(o t)-29.7(h)4.7(e s)-7(a)-22.4(f)8(e p)

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breastfeed twins and triplets, but some mothers choose to supplement with formula when their pregnancy has resulted in multiple births.

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Health professionals have a responsibility to inform parents about infant nutrition and it is important that mothers are informed, during pregnancy, about the bene ts of breastfeeding and the risks of arti cial feeding. However, should the mother choose to bottle feed then she should be given every support to do so as safely as possible and in a non-judgemental way.

Because of the overwhelming evidence and emphasis on the bene ts of breastfeeding, mothers who use formula can feel that they have failed (Lee and Furedi, 2005). A 2011 investigation (Hoddinott et al., 2011) of the perspectives of women and their wider family and social network on infant feeding, from pregnancy until six months after birth, identi ed a clash between idealism and realism. A similar nding was acknowledged in the ndings of a survey undertaken by the Royal College of Midwives (RCM, 2014) which recommends that support is given to women equally, regardless of their chosen infant feeding method.

Inadequate or inaccurate information may result in a range of serious risks to infant health. For example, unhygienic preparation of equipment, reconstitution, storage and administration of feeds may result in a risk of infection, dehydration, malnutrition and hypernatraemia. The RCM recommends that all parents who have

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introduction of appropriate complementary feeding. Its energy and nutritional

added to both infant formula and follow-on formula from the date it comes fully into effect in February 2020; until then it remains an optional ingredient in infant and follow-on formulae.

In the 2014, EFSA opinion on the composition of infant formula, the minimum values are target values and the maximum values should be regarded as upper limits not to be exceeded. The energy and protein composition of infant formula has reduced in recent years to resemble that of human milk more closely. The faster rate of growth seen in formula fed babies, compared to those breastfed, is thought to have been due to the higher levels of energy and protein in formula compared with breast milk (Koleztko et al., 2009).

There are a number of ingredients that are not mandatory for inclusion in infant formula, which means there is no obligation for manufacturers to include these in their products. These include nucleotides, non-digestible carbohydrates, 'probiotics', 'synbiotics' (a combination of pre- and pro-biotics) and taurine.

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The major brands call their infant formula ' rst' milk; in other words, the milk that a baby can start with from birth. The legislation allows rst milks (and also follow-on formulae) to be based on cow's milk, goat's milk or soy protein. (For soya protein-based milks, see additional note in section below). The proteins in formulae based on cow's milk tend to be whey dominant, (rather than casein dominant). Breast milk is whey dominant.

There are no requirements in the current or new upcoming legislation on the whey/ casein ratio which should be present in infant and follow-on formulae.

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may be slightly higher in total protein, although not higher in calories or fat; the much discussion on wanting to avoid excessive protein in infants due to its link obesity (Koleztko et al., 2009; Martin et al., 2014).

In recent years most manufacturers have removed ‘hungry milks’ from their co milk range; previously these were marketed as second milk product, prior to follow-on milk.

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

- s (ANDS MUST BE THOROUGHLY CLEANED BEFO equipment.
- s 4HE FEEDING EQUIPMENT AND THE PREPARA washed in hot soapy water.
- s "OTTLE AND TEAT BRUSHES SHOULD BE USED teats to ensure that all remaining feed residue is removed.
- s !FTER WA•0ING FEEDING EQUI0MENS P INSB

- 0OUR THE AMOUNT OF BOILED WATER REQUIRE
- !DD THE EXACT AMOUNT OF FORMULA POWDER A
  the label. Do not add more or less powder, as this constitutes a risk to the infant.
- 2EASSEMBLE THE BOTTLE KEEPING THE TEAT C
  shake gently until contents are mixed.
- 4HE CONTENTS CAN BE COOLED TO A FEEDING T
  the bottle under a running tap, ensuring that the tap water does not come into contact with the cap.
- #HECK THE TEMPERATURE BEFORE GIVING IT TO
  lukewarm, not hot. Discard any feed that has not been used within two hours or,

FROM BABY TO BABY n UNTIL THEY ARE SIX MO

capacity of the infant's stomach. Formula powder containers feature tables tha the typical volume to use, based on the age and weight of the infant.

Whenever possible, home routines should be continued in hospital. Infants sho be fed on demand if their condition allows it, and offered the amount required t satisfy their hunger and growth needs. Notwithstanding individual variations, r term infants will initially need to be fed every two to four hours, day and night.

All parents should have a discussion about responsive bottle feeding, to ensur their baby has as pleasant an experience as possible. Holding baby close, invi him to take the teat by gently rubbing it against his upper lip to encourage him open his mouth and pacing the feed will help the baby to retain some control.

Limiting the number of people involved with feeding will also help the baby fee secure and support a stronger bond between mother and baby. If others are in with feeding, encourage parents to make sure those helping use the same fee technique. Parents may need to be advised against overfeeding and, in particu advised against giving lots of milk in one feed in the hope that the baby will go longer between feeds. The baby is more likely to put on too much weight (or to sick) if they are given more milk than they want.

It has been shown that infants fed from a bottle (regardless of whether it conta formula or breast milk) were more likely to empty the bottle or cup in late infanc (Ruowei et al., 2010). This novel 2010 study was the rst to suggest that babies from a bottle per se lacked self-regulation compared with breast fed infants. In context, responsive feeding and attending carefully to the cues of hunger and s the baby is showing may be important to prevent overfeeding and putting the b risk of excessive weight gain.

This is a relatively new area of research but a recent systematic review conclu non-responsive feeding was associated with higher child BMI or overweight/ob and that more research was needed to test the ef cacy of responsive feeding interventions in the prevention and treatment of child overweight/obesity (Hurle Cross and Hughes, 2011).

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Completely breastfed 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).

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The recommended age at which solid foods should be introduced is about six months old. However, breastfeeding and/or formula should continue after six months, in addition to solid foods. Cow's 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.

Specialist formulas: foods for special medical purposes

Foods for special medical purposes (FSMPs) are foods specially formulated, processed and intended for the dietary management of diseases, disorders or medical conditions of individuals who are being treated under medical supervision. FSMPs are also known as medical nutrition products.

The composition of FSMPs is laid down in EC Directive 1999/21/EC and the manganese level in these products intended for infants and young children in Directive 2006/141/EC. The new legislation on FSMP, Regulation EU No 2016/128, published in 2016 brings the marketing provisions of FSMPs for infants in line with those for infant formulas, with some composition and labelling changes, and will apply from 2020. The reader is directed to the British Specialist Nutrition Association website www.bsna.org.uk for further and current information.

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Apart from follow-on formula, the formula covered in this section are all suitable to be used from birth and can be continued for the rst year of life or thereafter if indicated. Nutritionally complete until the age of six months, details of the

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The terms posseting, regurgitation or spitting up are also used to describe Gas oesophageal re ux (GOR). It is common for regurgitation to occur in babies du and immediately after feeding and this usually resolves by 12-15 months. How when the volumes of returned feed are signi cant and the baby has additional symptoms such as excessive crying, poor growth, regular vomiting, poor sleep food refusal, it may be appropriate to treat the condition. This may include recommending an anti-re ux formula or a thickener for the infant's current feed NICE 2015 guidance recommend a stepped-care approach to managing GOR formula fed infants NICE recommends a stepped-care approach:

1. parental reassurance
2. review feeding history and reduce feed volumes if excessive for infant's wei
3. offer a trial of smaller more frequent feeds (while maintaining normal total d volume of milk)
4. offer a trial of thickened formula.

If thickened formula does work, then consider a 1-2 week trial of alginate thera

It is worth noting that alginate therapy is recommended if thickened formula do not work and cannot be used with an anti-re ux formula.

GOR is never an indication to stop breastfeeding.

For breastfed infants:

1. assessment of breastfeeding and infant attachment
2. a special thickener can be given on a spoon before or after a feed.

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It is dif cult to ascertain the prevalence of lactose intolerance in infants as this often a short-term problem and is most commonly secondary to a bout of gastroenteritis, most often referred to as transient lactose intolerance; it has al

Congenital lactase de ciency is a very rare condition. It tends to develop after the age of two but symptoms may not be noticeable until adulthood; it is much more common in Asian populations.

The symptoms of lactose intolerance are gastrointestinal, caused by unabsorbed lactose moving to the colon. There bacteria ferment or break down the lactose producing fatty acids and gases causing loose stools, abdominal pain, atulence, bloating, and discomfort.

Manufacturers of lactose free formula use an alternative carbohydrate source to normal infant formula, for example glucose syrup, and are indicated in cases of suspected lactose intolerance.

The main brands also produce so called ‘comfort’ milks, which have been developed to manage minor everyday feeding problems such as wind, crying, symptoms of colic and being generally unsettled. These products have relatively minor alterations to their ingredients, compared to standard formula, and coued foe56e(d)-2.3s-26.3(6

Clinical conditions

Speci c guidelines from the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) on the feeding of pre-term babies (Agos al., 2010) recognise the differing needs of pre-term infants of different weights. preferred food for premature infants is forti ed human milk (expressed) from th infant's own mother, or, alternatively, formula designed for premature infants.

Mothers of pre-term babies are typically under a lot of stress and suffering from anxiety; this may detrimentally affect their milk supply, resulting in the use of a special formula. The ESPGHAN guidelines provide recommendations for the nutritional composition of formula feeds used in pre-term infants. The composit res used imasoi3e19.1(i).9620.4riti36(i)-6(f)87.
r1h(i)-8.0(9)-13.7(i)-22.73.3(e)sedhy; this mauhstion 8ene tm 829.7(h)4.7(e)-4.5

diagnosed. Amino acid formulae have a very distinct taste which may be unpa for infants and young children, so the transition to these formulae should be managed under the care of a health care professional.

In the UK, soya formulae are not recommended in infants less than 12 months 2004) but can be useful in older infants who are refusing hypoallergenic formu About 10% to 14% children with Ige-mediated CMA are also allergic to soya (Klemola et al., 2002).

-ILK FROM OTHER MAMMALS n FOR EXAMPLE S recommended for the management of CMA because of the similarity of their proteins to that contained in cow's milk (Fiocchi et al., 2010).

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The subject of allergy prevention has been contentious for a number of years, con icting ndings from scienti c studies. The rationale is that in high risk infant who are not breast fed, it is possible to prevent the onset of an allergy by feedi either an extensively or partially hydrolysed formula. At risk infants are determ by family history, generally said to be indicated by the presence of allergy in at one parent and/or sibling. Despite remaining a divisive topic, a recent review (Vandenplas et al., 2014) of the systematic reviews on the topic concluded that high risk infants where breastfeeding is not possible, hydrolysates of documen safety and ef cacy have an indication in infant feeding up to the age of 4 to 6 months." The review stated that the use of hydrolysed formula in low risk infant was not recommended.

suit the infant's requirements. 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 in uences 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 dietitian. There are many different types of specialised formulae and supplements that can be prescribed for speci c conditions; for example, metabolic disorders or kidney disease. It is important to select and appropriate formula for each condition as without careful selection, the child could become unwell. A list of items that can be prescribed for paediatric use appears in the BNF (British National Formulary) for children under the Borderline Substances Appendix and is also available online at www.bnf.org

100kcal/100ml, compared to a standard feed which is typically 66-67kcl/100m formulae are available in liquid format and are suitable from birth.

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There are a number of situations where enteral (tube) feeding may be consider example, an inability to suck or swallow, anorexia due to chronic illness, increa requirements, congenital abnormalities, primary disease management or food refusal. Where there is no clinical contraindication and the infant has normal nutritional requirements, expressed breastmilk, a standard infant formula or fo on formula may be tube-fed. Otherwise a specialised formula, a high energy o adapted standard formula is indicated; seek advice from a paediatric dietician.

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The following routes are available for enteral feeding (Johnson, 2014):

- NASOGASTRIC – THIS IS THE MOST COMMON feeding will be short term
- GASTROSTOMY – THIS IS WIDELY USED W FE
- [illegible]BE

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“	High: 130 150 kcal (545 630 kJ)/kg/day Very high: 150 180 kcal (630 750 kJ)/kg/day
€	High: 3 4.5 g/kg/day Very high: 6 g/kg/day

*based on actual, not expected, weight.

Where can I find out more?

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

- WOMEN FEEL ENABLED TO INITIATE AND CONTINU they wish
- PARENTS ARE SUPPORTED TO MAKE INFORMED C that everyone is aware of the signi cant bene ts associated with breastfeeding.

To learn more about the RCN's commitment to breastfeeding and participation in breastfeeding related initiatives, plea ase visit www.rcn.org.uk

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