Central Lancashire NHS
Primary Care Trust

Child Nutrition Guidelines

Developed March 2008

Forward

Central Lancashire PCT Child Nutrition Guidelines [March 2008]

It is with great pleasure that I present Central Lancashire Primary Care Trust's Child Nutrition Guidelines. They support the PCT's vision of promoting health, reducing health inequalities and preventing illness where possible.

It is estimated that there are about 24% of adults in Central Lancashire who are obese and that this number is rising (Statistics on Obesity, Physical Activity and Diet: England, January 2008). Approximately 12% of children in Central Lancashire are obese (NCOD 2006/7) and it is essential that we work with our partner agencies to reduce these numbers to prevent further obesity and associated problems. We know that at least 80% of premature heart disease, stroke and type 2 diabetes and 40% of cancers could be prevented by eating a healthy diet, taking physical activity and avoiding use of tobacco products.

The guidelines have been developed through collaboration across the legacy PCTs areas to reflect the child nutrition issues experienced in our diverse population. It is of vital importance that children get the best start in life. The path to good nutrition can be started from preconception and particularly at birth with breastfeeding, and in later months and years by encouraging children to explore and develop tastes for a wide variety of healthy foods.

These guidelines provide a resource to support for front line staff working with parents and carers of children and provide a wealth of information about nutrition in childhood.

I would like to thank all the agencies and staff who have help to developed this important and useful resource.

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Breastfeeding

Rationale

Breastfeeding is the best form of infant nutrition for infants. Exclusive breastfeeding is recommended for the first six months (26 weeks) of an infant's life. Six months is the recommended age for the introduction of solid food for infants. Breastfeeding (and/or breast milk substitute, if used) should continue beyond the first six months, along with appropriate types and amount of solid foods (DH 2004).

Why breastfeeding is important

Infant feeding practices have significant consequences for the health and well being of its population. Breastfeeding is associated with a reduction in both short and long term health risks for both mother and infant e.g.

- Reduction in GI infections
- Decrease in obesity
- Reduction maternal cancers
- Reduction of otitis media

Human breast milk contains water, fat, protein, carbohydrate, minerals and vitamins. In addition, breast milk contains other important factors; hormones, enzymes, growth factors, essential fatty acids, immunological and non-specific protective factors. The proportions of these vary according to the stage of lactation, time of day and the amount of milk taken at each feed. Breast milk is more than simply a form of nutrition. It is also a living fluid, which protects against infections through the presence of white blood cells and anti-infective agents. It is unique and formulae cannot be considered as an equivalent.

Antenatal period

All women should be given the opportunity to discuss infant feeding during pregnancy with a health professional. The health benefits of breastfeeding over formulae feeding should be explained to all parents/carers. Failure to discuss these issues does not adhere to the principle of informed choice.

Antenatal classes should not be relied upon as a sole means of conveying information about infant feeding to women. A woman who is undecided about how she wishes to feed her infant should be given information and opportunity for discussion but not pressurised into a final decision as she has every right to keep her options open until her infant requires his/her first feed.

Early initiation of feeding

All mothers should be encouraged to hold their infants in skin to skin contact immediately after birth or as soon as possible afterwards. The infant should be offered his/her first feed when he/she shows signs of readiness. Skilled help should be made available.

Positioning and attachment

It is most important that an infant who is to be breastfed is correctly positioned and attached to the breast. Correct positioning and attachment of the infant at the breast will reduce the risk of the mother developing sore nipples, blocked ducts, mastitis or being unable to produce sufficient milk to satisfy the infant's needs. The indicators of effective positioning and attachment should be explained to the mother.

When an infant is effectively attached to the breast

- His/her mouth is wide open and he/she has a large mouthful of breast.
- His/her chin is indenting the breast.
- His/her lower lip is curled back.
- There is more areola visible above his/her top lip than below his/her bottom lip.
- His/her nose is either touching or very close to the breast, but is not squashed.
- His/her cheeks are rounded and not sucked in.
- Rhythmic sucks, swallows and pauses should be observed.

Whilst attachment needs to be precise, many different positions are possible provided four key principles apply

- The infant's head and body should be in a straight line.
- The mother should hold the infant's body close to hers.
- The infant should face the breast, with his/her nose opposite the nipple.
- The position should be sustainable for both mother and infant.

Frequency of feeds

Infant-led feeding is essential to ensure that the milk supply meets the infant's needs. As every infant's needs will differ, the pattern of feeding cannot be predicted and should not be prescribed. A change in length and frequency of feeds are likely to increase in response to growth spurts and warm weather.

Rooming-in during the hospital stay facilitates infant-led feeding and allows a mother to become familiar with her infant's behaviour throughout the 24-hour period and consequently more confident when she returns home.

The use of supplementary feeds

Breastfed infants should not receive any water or artificial feeds unless medically indicated. Parents/carers should be consulted if supplementary feeds are recommended and the reasons discussed with them in full. Parents/carers who choose to supplement with formulae, other foods and drinks should be made aware of the health implications to allow an informed choice.

Use of dummies and artificial teats

Mothers should be advised against the use of dummies and artificial teats during the establishment of breastfeeding and warned of the possible detrimental effects of their use.

NB *This does not apply to infants receiving top up naso or orogastric feeds, where the use is standard practice to facilitate the process.*

Nipple shields should only be used after the onset of lactation and when all other options have been explored. Professional support should be provided to ensure that their use is only short term.

Routine use of creams and sprays

There is little evidence to support the use of any creams or sprays to prevent nipple soreness. Correct attachment is the most important factor in the prevention of trauma.

Continuing successful breastfeeding

A woman's experience of breastfeeding should be discussed at each contact to assess attachment, positioning, and evaluate her infant's health while identifying any need for additional support. Reassurance should be offered to help the mother gain confidence in her ability to breastfeed. Breastfeeding support should be made available regardless of location of care and all healthcare staff involved in the care of mothers and their infants should be trained in the skills necessary to support breastfeeding mothers and their families. All support should be culturally appropriate.

Healthcare settings should provide a welcoming atmosphere for breastfeeding families and facilitate co-operation between health professionals, support groups and the local community to make breastfeeding easier. Contact details for midwives, health visitors, infant feeding advisors, voluntary breastfeeding supporters, counsellors and support groups are to be made available to all mothers.

Expression and storage of breast milk

The technique of hand expression should be taught to all mothers with an explanation of its potential usefulness. All relevant healthcare workers should be able to teach this skill.

Expressing breast milk can be useful for a variety of reasons including prevention and/or relief of breast conditions, stimulation and maintenance of the milk supply and to enable someone other than the mother to feed the infant. All mothers leaving Lancashire Teaching Hospital who are breastfeeding are provided with the leaflet "Breastfeeding Skills" demonstrating the skills of positioning, attachment and expressing.

If a mother and infant are separated for medical reasons, the mother should be given all the advice and help to express her milk and maintain her lactation. Support for mothers admitted to hospital can be obtained from the Infant Feeding Advisors, Tel: **01772 524512.**

The conditions necessary for the safe storage of breast milk depend on how the milk is to be used. A mother storing milk at home for giving to her own well infant may need to take fewer precautions than staff within a hospital for sick and/or pre term infants.

Good hygiene is essential and expressed breast milk should be collected in a sterile storage container. Breast milk can be kept up to five hours at room temperature, between 3 to 5 days in a domestic refrigerator at a temperature of 2 to 4 Celsius, up to one week in the ice-making compartment of a domestic refrigerator and up to 3 months in a domestic freezer. Frozen breast milk may be thawed slowly in a refrigerator and used within 24 hours or at room temperature and used immediately.

Many domestic refrigerators cannot reliably be kept at a constant temperature and it is therefore recommended that mothers freeze any milk that they do not intend to use within 24 hours (UNICEF UK Infant Friendly Initiative).

Nutritional needs of the breastfeeding mother

A healthy diet for breastfeeding women is the same as for other adults. Encouraging breastfeeding and healthy eating at this time helps to promote future health for the infant, mother and the rest of the family. Hunger and thirst should be allowed to regulate maternal food and fluid intake. Energy requirements increase during lactation and this can come from the diet and/or the mother's fat stores. The advice is to make eating a priority, to eat smaller meals more frequently and to drink plenty of fluids especially water, milk, and juices. Nutritional advice may include the need to eat plenty of fruit and vegetables, energy giving starchy foods like bread, pasta, pulses and potatoes, dairy products for calcium, fibre and a sources of protein each day.

Peanut avoidance – in 1998, the committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, issued precautionary advice that 'pregnant or breastfeeding women who are themselves atopic, or where another first degree relative of the child is atopic, may wish to avoid eating peanuts and peanut products during pregnancy and lactation.

N.B *This document does not specifically address guidance on maternal diet.*

Possible problems and suggestions for treatment

Sore nipples.

- Check the positioning and attachment of the infant. Most cases of nipple trauma are due to poor positioning and attachment.
- Suggest that the mother alters her feeding position, for example, from lying to sitting so that the infant's jaw applies pressure on a different and hopefully undamaged area of the breast.
- Suggest that the mother starts each feed on the least sore breast.

Other considerations when managing sore nipples include:

Thrush. In some cases, a woman may describe intense pain in the nipple or breast, which is not improved by changing the attachment of the infant to the breast. There

may also be shooting pains within the breast, nipples that are cracked and not healing and sometimes loss of nipple colour. Such signs are highly suggestive of Thrush and often arise suddenly after a period of problem-free breastfeeding. There is often a history of recent antibiotic therapy and dummy use is also associated with an increased risk of Thrush. Taking a swab or milk specimen for culture and sensitivity is not usually helpful as candida is a difficult organism to grow in the laboratory and there is a high risk of contamination with surface bacteria. Both mother and infant will require treatment to avoid re-infecting each other.

Moist wound healing. Recent research suggests that moist wound healing may be an effective means of treating sore or damaged nipples. Applying highly purified lanolin ointment sparingly to the damaged area after each feed can create a moist wound-healing environment. However, other creams/sprays may cause more problems than they resolve and if an allergic reaction is suspected, then they should be stopped.

Silicone nipple shields. These are not usually considered effective in the treatment of sore nipples and can cause other long-term problems with inadequate stimulation of the breast; therefore they should only be used on a short-term basis as milk production may be reduced with prolonged use.

Resting the nipples. In extreme cases, it may be appropriate to rest the nipples but milk production must then be maintained by expressing the breasts. In the absence of any improvement refer to appropriate skilled help for further assessment.

Breast engorgement.

- Provided that infant-led feeding is encouraged and attachment to the breast is correct, engorgement of the breasts should not be a problem.
- Encourage frequent feeding of the infant, reassuring the mother that if she does this, engorgement will only be short lived.
- If the nipple is not protruding, warm flannels and gently hand expressing should encourage sufficient let down of milk to allow the infant to feed.
- Cold flannels applied to the breasts between feeds may be soothing.
- Many mothers find the support of a well fitting bra helpful.
- Mild analgesia in severe cases.

Blocked Ducts, Mastitis and Breast Abscess. These conditions can occur when milk is not removed from the breast at the same rate as it is being produced.

A blocked duct will be recognised as a tender and palpable lump in the breast tissue. The mother feels well otherwise. Mastitis has developed if examination of the breast reveals a reddened tender wedge-shaped area. If no treatment is instigated the mother may become pyrexial and complain of "flu like" symptoms. Mastitis can be either non-infective or infective, the latter being more common when there is nipple trauma. Untreated or inappropriately treated mastitis can lead to the development of a breast abscess.

Initial treatment is the same for both blocked ducts and suspected mastitis.

- Feed frequently from the affected breast.
- The use of warmth will help to keep the milk flowing e.g. a bath, shower or the application of warm flannels.
- By altering the position of the infant, it should be possible to clear all the ducts.
- Gravity can further help efficient milk drainage and it may be helpful to lean forward when feeding.
- Massage the breasts. Massaging any lumps towards the nipple.
- Where a fever has developed which is not responding to treatment within 24 hours, medical aid should be sought. Antibiotic therapy is usually indicated but breastfeeding should continue. Abrupt cessation can increase the risk of abscess formation.
- A suspected breast abscess should be immediately referred for a medical opinion. Breastfeeding need not be discontinued on the affected side unless pus is draining from the nipple or the mother finds it too painful. Gentle expression of the affected side should be undertaken to drain the breast of milk.

Insufficient milk

This is the main reason given by women for changing from breast to formulae feeding. However, it is estimated that less than 2% of women will be physiologically unable to lactate. In most cases it is poor breastfeeding advice and management that cause a mother to become unable to provide sufficient milk for her infant. In addition, lack of confidence can lead some mothers to believe, incorrectly, that they have insufficient milk. Professionals should always be conscious of how easy it is to reinforce this belief either by inadvertent remarks or by too quickly recommending the use of complementary feeds. A positive and supportive attitude is extremely important.

In situations where complementary feeds are deemed necessary the breast feed should always be offered first and the complementary feed offered as infrequently as possible and in as small a volume as possible.

Overproduction of milk

This may occur once breastfeeding is established and should not be confused with primary engorgement.

It may be necessary to reduce stimulation by offering only one breast at each feed. If the infant finds feeding difficult, encouraging the mother to lie down to feed can also reduce

the speed of milk ejection. Encouraging the let down reflex before offering the infant the breast avoids the problem of the infant choking on an initial rush of milk.

Flat and inverted nipples

Skilled help positioning the infant in the early days is of particular importance. There is no research evidence to suggest that the use of Woolwich shells is effective. It should be remembered that considerable changes in nipple shape can occur during pregnancy and the early postnatal period.

Blood in breast milk

If there is blood in the infant's vomit, establish the source. Blood in breast milk is not in itself a contra-indication to breastfeeding.

Drugs

There are certain drugs taken by the mother that can be passed through the breast milk. Specific advice should be sought from the general practitioner or pharmacist. Advice given to the drug dependant mother will depend upon her individual circumstances and will be influenced not only by the nature, quantity and variety of drug but also by how well she is/can be monitored and how stable she is on her stated drug regime.

If there is any concern about the effects of a prescribed or illicit drug on a breastfeeding mother and her infant, advice can be obtained from the Drug Information Line Tel: **01257 245839** (CDH). Wherever possible these enquiries should be made during the antenatal period.

Breastfeeding under special circumstances

The jaundiced infant.
Physiological jaundice should resolve within the first two weeks. Prolonged jaundice should be investigated, however it is not a contra indication for breastfeeding.

Breastfeeding following operative delivery.
The mother may need to be reassured that this is not a contra-indication to successful breastfeeding.

Multiple births.
Mothers of twins or triplets should be fully supported in their decision to breastfeed and assisted to develop individual techniques, which suit them and their infants.

Contact telephone numbers for local support groups/twins clubs should be made available.

Ankylogossia (Tongue Tie).
Can be a cause of sore nipples and/or failure to thrive. If breastfeeding difficulties persist after a review of positioning and attachment, referral for surgical intervention to release the tongue-tie should be considered.

The infant with special needs.
This does not necessarily mean that breastfeeding will be impracticable. Careful individual assessment is necessary.

Mothers with HIV infection/Hepatitis.
If the mother is known to be HIV positive, the current recommendations are that she should not breastfeed her infant.

Expert opinion should be sought in order to give appropriate and specific advice about breastfeeding to a woman with Hepatitis infection.

Breast Surgery.
The exact nature of the surgery needs to be determined and if there is any doubt about the feasibility of breastfeeding the surgeon who performed the operation should be consulted.

Breastfeeding may be possible following Silicone Implants and Reduction Mammoplasty, provided that the nipple has not been resited. In some cases even with nipple involvement, milk secretion may still be evident; therefore each case should be individually assessed.

Return to work.
Employers have a duty to support a mother's return to work by providing working conditions conducive to the expression and storage of breast milk.

In preparation for return to work, a mother can start practising giving their infant expressed breast milk or water. Once back at work, a mother can express her milk and use fresh expressed milk for the next day's feed or feeds. Breastfeeding can continue at all other times when with the infant.

If the mother decides to reduce the frequency of feeds or stop breastfeeding, it is best to gradually reduce the number of feeds over 2 to 4 weeks to prevent any problems.

Infant led introduction of solids.
Breastfeeding as part of a mixed diet can continue into the second year.

Most infants will show signs of readiness to actively take foods from a spoon and be able to finger feed from around 6 months but breastfeeds will become much shorter.

Key Messages for Successful Breastfeeding

- Effective positioning and attachment.
- Baby led feeding and the avoidance of supplements.
- Prompt management of problems.
- Facilitating continued breastfeeding if mother and baby are separated.
- Referral of mothers and babies to the breastfeeding support networks.
- Full training in the support and management of breastfeeding for those working with mothers and babies.

Infant Formulae

Breast-feeding should be encouraged but if this is not possible or desirable, an infant formulae is a suitable alternative. When used, infant formulae should be the sole source of nutrition until the infant is weaned around 6 months of age and thereafter as part of a mixed diet.

Parents/carers should be supported in their informed choice and receive advice on appropriate equipment and preparation of infant formulae feeds.

Choice of formulae

The WHO Code 1981 recommends that when advice is sought regarding the choice of infant milk, the following points should be remembered:

- No advertising or promotion of infant formulae through the health service.
- No supply of free samples.
- Information and educational materials should include the social and financial implications of the use of infant formulae and the health hazards of inappropriate foods or feeding methods.

Formulae milk preparation

Infant milks are available as
a) powders which require the addition of water or
b) liquids that are 'ready to feed'.

Instructions on preparing feeds for the infant are provided by the manufacturer on the packaging and should be followed carefully. The Department of Health and Food Standards Agency have revised their guidance on the preparation and storage of infant milk as follows (February 2006).

- Good hygiene practices should be encouraged. Hands should be washed before preparing feeds and before offering feed to the infant.

- All equipment used should be sterilised (bottles, teats, lids, scoops etc). Feeding bottles should always be sterilised. Introduction of solids utensils should be sterilised if the infant commences introduction of solids diet before the age of 6 months.

Available methods of sterilisation are:

Chemical:	Use of hyperchlorite solution (cold water)
Steam:	Use of steam steriliser (electrical or microwave sterilising unit)
Boiling:	Boiling of equipment. Must be submerged in water and boiled for 10 minutes

- Formulae should be made up using boiled fresh tap water that has been left to cool for no more than 30 minutes.

N.B *Artificially softened, filtered, natural mineral and fizzy waters should not be used as the process used to bottle them can affect their composition. Some natural mineral waters have mineral contents, which are unsuitable for infants. There are some bottled waters that are suitable these have the statement 'suitable for infant feeding on their labels'. Bottled water is not sterile, so like tap water, it should be boiled and cooled before making the formulae.*

- Feeds should be made up fresh for each feed where possible. Parents/carers, who require a feed for later, are advised to keep water they have just boiled in a sealed flask and make up fresh formulae when required. Alternatively they could use a ready to feed formulae.

- The temperature of the feed should be tested and, if required, cooled by holding the bottle, with the lid covering the teat, under cold running water.

- Any left over milk should be thrown away.

In addition:

- No sugar, salt or solids such as rusk or cereals should be added to the bottle. Adding solids will change the consistency, increase the risk of choking and may increase gut sensitivity.

- Parents/carers who choose to make up feeds in advance should be advised to store the infant milk in the body of the refrigerator (not the door) for a maximum of 24 hours. Any unfinished feed or feed not consumed within 24 hours must be discarded.

- If the feed has been prepared in advance and stored in the refrigerator, standing the bottle in hot water should warm it. Care must be taken if using a microwave to reheat feeds, hot spots can occur. The feed should be vigorously shaken and the temperature checked before offering it to the infant. Milk should not be reheated more than once.

Giving a bottle feed

The first feed should be offered shortly after delivery, providing the infant is well. Skin to skin contact should be encouraged within the first hour of delivery.

Subsequent feeds should be given 'on demand' as dictated by the infant's appetite, providing the infant is a full term healthy neonate. Unwell infants will require special consideration. Baby led feeding should be encouraged as dictated by an infant's appetite

- When the infant is being fed, it should be held close, similar to the position of a breast-feeding infant.
- The hole in the teat should not be too large (to prevent choking), or too small (to prevent the infant from tiring).
- Infants may require a number of small breaks during the course of a bottle-feed. Feeds should not be reheated; any unused feed should be discarded.

All infants are different and feed requirements will vary. During the early months infants require approximately 150mls – 200mls per Kg body weight total volume per day. This is usually offered by demand in 6 – 8 feeds. The volume of each feed may vary but the concentration of the feed should remain the same.

Monitoring progress:

An infant who receives adequate nutrition will
a) Maintain their body temperature
b) Settle and sleep after feeds
c) Pass urine and stools on a regular basis
d) Lose up to 10% of their body weight in the first 3 days, regain their birth weight by 10 days, and continue to gain weight thereafter.

Nutritional composition of infant formulae

The nutritional composition of infant formulae when correctly prepared is designed to be as close to the composition of human breast milk as possible. Infant milk manufacturers have to comply with stringent guidelines (Present Day Practice in Infant Feeding – HMSO 1988) and continually strive to improve their products through research and development. However, infant formulae do not contain any of the anti-infective benefits of breast milk.

Most of the infant formulae available are based on cow's milk. Some are based on other proteins, for infants with special requirements e.g. soya, these should be used with caution and under the guidance of health care professionals.

1) Standard infant milk formulae:

Unmodified cow's milk is unsuitable as a sole source of nutrition for infants, because of its high protein content and mineral profile. Cow's milk based infant formulae contain milk that has been altered in accordance with strict guidelines. Such formulae are classified to whether the main protein is whey (lactalbumin) or casein.

Whey based milk formulae include:

SMA Gold (Wyeth Nutrition)
Cow and Gate Premium
Aptamil First (Milupa)
Farley's First

Casein infant milk formulae include:

SMA White (Wyeth Nutrition)
Cow and Gate Plus
Aptamil Extra (Milupa)
Farley's Second

Whey based milks have a predominance of whey protein, which provides a protein profile that most closely resembles that of breast milk. Casein based milk has a higher predominance of casein; this protein takes the infant slightly longer to digest.

Whey based formulae which closely resemble breast milk are recommended from birth for as long as possible. *(HMSO 1991)*

NB *In some areas it is common practice for mothers to change their infants from whey based to casein-based formulae, as the infant gets older. A reason for this is that the mothers believe that a casein dominant formulae would be more satisfying (generally they are marketed for hungrier infants). Such beliefs are anecdotal, and there is no evidence to support the changing of feeds from one brand or type to another. It should be noted that the nutritional composition of the whey-based infant milks and casein-based infant milks are very similar and that there is no difference in the kilocalorie content. Hungry or unsatisfied infants should be offered more frequent and larger feed volumes rather than a change of formulae. However, a change of formulae would be preferred to the premature introduction of solids.*

2) Low birth weight/pre-term infant formulae:

Low birth weight infant formulae were developed for low birth weight infants, both pre-term and small for gestational age. These formulae comply with the recommendations for feeding low birth weight infants and are of an energy and nutrient dense composition.

Examples:

Nutriprem 1 and 2 (Cow and Gate)
Milupa Pre Aptamil
SMA Gold Prem

Low birth weight formulae are designed to be used until the infant reaches approximately 2 – 2.5kg (Nutriprem 2 can be used until age 6 months). At this point the infant can be changed on to a standard infant formulae/high calorie infant formulae depending on their level of catch up growth.

These infant formulae are unsuitable for full term infants, including those with faltering growth. Their use should always be monitored under the direction of the medical practitioner.

3) Follow on milks:

It is recommended that breast milk or whey based Infant formulae should continue to be used as a main milk up to 1 year of age, from when pasteurised whole cow's milk (full fat) can be used as the main milk drink.

Follow on milks are marketed for use from 6 months of age:

Examples:

SMA Progress
Cow and Gate Step Up / Next steps
Milupa Aptamil Forward
Farley's Follow On

For the majority of infants, no benefit is served from the introduction of follow on milk when compared with continuing with a standard infant milk formulae. Follow on milk contains more iron and vitamin D than cows' milk. It has been suggested that the higher iron content could compensate for a low iron intake brought about by premature introduction to cows' milk, an excessively high intake of cows' milk or a poor introduction of solids diet. In most cases advice and support for the mother from health professionals (about the timing and types of introduction of solids foods) should assist the mother to feed her infant an adequate iron containing diet.

4) Pre-Thickened infant milks:

Some children suffer from frequent vomiting / gastroesophageal reflux. For these infants thickened formulae can significantly reduce the symptoms. Pre thickened formulae such as Enfamil AR or SMA Staydown are based on standard infant milk formulae but have a thickener added in the form of rice or cornstarch. They are designed to flow freely through a standard teat and thicken when they reach the acid content of the stomach, thus reducing the incidence of reflux.

Alternatively thickeners can be added to the infant's standard formulae. These tend to thicken in the bottle and can be more difficult for the infant to feed.

If symptoms do not settle on thickened formulae and the infants' growth is faltering, he/she should be referred to a Paediatrician for further investigation.

5) Other milks:

For advice on other milks such as soya milk, protein hydrolysates, amino acid formulae, other animal milks, cereal and nut milks. See section on food allergy and intolerance.

Water

Water is vital for good hydration in infants and children. It is the basis of all drinks, including formulae feeds. Children's water requirements vary with age. Breastfed infants do not require additional water, as they get all they need from breast milk. Bottle fed infants can have additional water when thirsty, e.g. in hot weather. However, this should be in addition to, not instead of, the normal number of bottle feeds.

For infants under 6 months, tap water should be boiled and cooled before drinking. Normal tap water is fine above this age.

As milk intake decreases, water obtained from drinks becomes increasingly important.

Infants with fever, diarrhoea or vomiting will require additional fluid to replace losses. Seek medical advice.

Water intake should be higher in warm weather, and when a child is exercising.

Water and infant formulae

Infant formulae powder is not sterile; the risks associated with using powdered infant formulae milk are reduced if:

- Feeds are made up using boiled water that is greater than 70°C; in practice, this means using water that has been left to cool for no more than half an hour
- Feeds are made up fresh for each feed; storing made up formulae milk may increase the chance of a infant becoming ill and should be avoided
- Any left over milk is thrown away
- Mothers, who require a feed for later, are advised to keep water they have just boiled in a sealed flask and make up fresh formulae milk when needed or use a liquid ready-to-feed formulae.

(Food Standards Agency 2006)

Bottled water

Bottled water, other than those labelled 'natural mineral water' are expected to conform to the same safety standards as the public water supply, and so they are suitable to give to infants and children, or for preparing formulae feeds. Bottled water should be boiled and cooled, as for tap water, before using to make up infant formulae.

Natural mineral water is not as strictly regulated as tap and bottled water, and may contain higher levels of solutes such as nitrate, sodium, fluoride and sulphate, which are not suitable for young infants. Giving these waters can lead to solute overload. Effervescent water of any kind is not suitable for infants.

Water softeners

Artificially softened water should not be used to prepare formulae feeds, because of the altered mineral levels. Water filters are also not recommended, because of the potential for bacterial growth or toxins, or the ingestion of silver from water cartridges.

Water as a drink

For young children, water is the best choice of drink for quenching thirst between meals. It contains no sugars that damage teeth.

If given too frequently, excessive intakes of water can affect a child's appetite by making them too 'full' for solids or milk feeds. It is best not to allow a child to continually sip any drink between meals.

Key Messages

- Bottled (with the exception of natural mineral water) or tap water can be used for making up infant formulae, but all water used should be boiled and cooled first.
- Mineral waters should not be given to infants and young children, due to the risk of solute overload.
- Water is the best drink for children, as it contains no kilocalories and is not harmful to teeth.

Drinks for Older Infants and Young Children

Milk

Milk can be given as a drink to all children from birth. For children under 1, only breast milk or appropriate formulae milk should be given, although from 6 months cows' milk and cows' milk products can be used in solid food. Please seek the advice of a health professional if you are not sure which formulae to use. Once children reach 1 year of age, cows', goats' or sheep's milk (if tolerated) can be used as a drink. If these are not tolerated, a special alternative formulae can be recommended by your healthcare professional.

Children under 2 years should have full-fat milk only. Above the age of 2, semi-skimmed is fine for those children who are eating a good, varied diet. Skimmed milk should not be used until the child is 5 years old. Any child who is not eating well should stay on full cream milk.

Fruit juices

Fruit juices are a good source of vitamin C and help with the absorption of dietary iron at mealtimes. However, like water, giving too much of this can affect a child's appetite for milk or solids. Fruit juice also contains natural sugars and fruit acids, and can cause tooth decay. It is therefore important not to give fruit juice to infants less than 6 months old.

After 6 months, fruit juice can be given if diluted one part juice to ten parts cooled boiled water. This should be given from a cup, and is best given with meals.

Squash/cordial/fizzy drinks and flavoured milk

These are not suitable for young infants due to the high sugar content. They can also cause a poor appetite if they are given frequently, causing a child to 'overfill' on liquids at the expense of solid food or formulae feed.

Older children should be given these only with meals, and only from a cup to minimise the effect on teeth. They should always be well diluted. These drinks should never be given at bedtime or through the night, either in a bottle or a cup.

Infant juices/herbal drinks

These also contain sugar and are therefore not recommended.

Diet/No Added Sugar drinks

These are not intended for infants and toddlers. Older children can have these, but they can still detrimentally affect the appetite if too much is consumed, and, as they contain acids, can also cause tooth decay.

Tea and coffee

These are not suitable for children under 5, as they contain ingredients that prevent absorption of iron from solid foods, which may lead to anaemia.

Older children can have these drinks, but it is best to keep them at least $^1/_2$ hour before and after mealtimes to limit the ill effects on the iron absorption. It is best if sugar is not added to these drinks, to minimise the risk of tooth decay.

Key Messages

- Breast milk, formulae feed and water are the best drinks for young children.
- Older children can have other drinks, but be careful of the sugar content.
- Drinks should not be given instead of solids or milk feeds.

Dental Health

By the age of five 56% of children in this area have experienced tooth decay. Much of the pain and distress this may cause to the child, not to mention the anxiety to parents/carers, can be prevented. Teeth in young children are particularly vulnerable to the by-products of an unsuitable diet. Parents/carers need support and advice, to ensure that the harmful affects of the acid damage to tooth enamel are minimised.

Tooth decay is caused by the action of acids on the enamel of the tooth surface. Bacteria feeding on the sugars in the mouth produce this acid. Given sufficient time, the saliva is able to wash away the acid and neutralize its effect. Snacks and drinks, containing sugar, which are consumed between meals, can cause the teeth to be constantly bathed in sugar. "Sugar free" drinks and pure fruit drinks can also be acidic.

In view of the fact that the dental health of some children in the district is poor, it is especially important to highlight the areas of the guidelines, which should be followed to reduce the harmful effects of sugar and acid, and to promote ways of reducing the vulnerability of erupting teeth.

Dental decay can be avoided by ensuring that, as a rule, snacks and drinks between meals do not contain sugar.

- Sugar should not be added to bottle feeds.
- Milk and water are the only 'safe' drinks for teeth.
- Pure fruit drinks should be well diluted, 1 part juice to 10 parts water, kept to meal times and not served in a bottle.

Recommended 'safe' snacks for toddlers and older children include:

- Peeled and chopped fruit and vegetables, bread sticks, crackers and cheese, any type of bread
- Remember added sugar can have many different names e.g. sucrose, dextrose, glucose, fructose, honey and maltose
- Sugar is no longer recommended to prevent constipation.

N.B *Sugar-free medicines should be used whenever possible.*

Flouride

Fluoride can help reduce tooth decay by making the enamel stronger and by reducing the effects of acid damage. Fluoride in the water supply provides benefits for all age groups in the community. However, the water supply in this area does not contain a high enough level of fluoride to be beneficial to teeth.

Regular brushing with a fluoride containing toothpaste can provide protection. This should be started soon after the teeth appear with a smear of "family" toothpaste on a very small toothbrush. Do not rinse.

1) The current guidance, issued by the Department of Health to dentists, recommends the use of 'at least 1000 ppm (parts per million) fluoride toothpaste' for children at medium to high risk of developing tooth decay (caries), aged birth to 6 years.

2) A large high quality study, conducted in the North West of England produced strong evidence of the caries preventive effectiveness of 1450 ppm in children from the age of 12 months.

Until this guidance is released, we recommend the use of family fluoride toothpaste containing at least 1000 ppm. There may be a greater preventive benefit could be derived, from using a toothpaste containing 1450 ppm.

Hungry Infant

Check with parent that the infant has been genuinely hungry or not satisfied for a period of time as the infant could be unsettled due to other reasons, such as colic.

If **breastfeeding** check that the mother is taking a good diet and adequate rest **(for further information see breastfeeding section)**

If **bottle-feeding** and the infant (under the age of six months) is consistently emptying bottles and remaining hungry the amount of food, but not the concentration, may be increased.

Possible indicators may include:

- Waking at night in a previously settled infant
- Demanding larger feeds more frequently
- If the child is too young to be weaned

If the infant is of the recommended age and remains hungry consider introduction of solids **(see section on introduction of solids).**

Introduction of Solids

Introduction of solids is the process of expanding the diet to include foods and drinks other than breast milk or infant formulae.

By the age of 6 months the infant's nutritional requirements cannot be met by breast milk or infant formulae alone. Consequently, it is necessary to start introducing other foods.

This is important for the development of oral motor skills and speech. Introducing solids will not start at exactly the same age or weight for all infants. It is the gradual process taking weeks or months, progressing from milk alone to mixed feeding including family foods.

Milk remains an important source of energy and nutrients, because foods are only accepted slowly. The continued use of breast milk or formulae milk should be recommended up to one year of age.

Introducing solids is often a confusing process and many parents/carers find it difficult to decide which foods their infant should have, making this a potentially stressful time. Health professionals need to give support and advice at an early stage *(Griffiths 2002).*

Sometimes introducing lumps can be a more difficult stage. Parents/carers should be encouraged not to put it off, as the longer it is left, the more difficult it may become.

Preterm infants are a special case and individualised advice should be sought from the neonatal outreach nurse however further guidance can be sought at the end of this section.

The aims of introducing solids are:

- To replenish lowered iron stores
- To encourage acceptance of textures and tastes at an optimum time in the child's development
- To encourage good eating habits this will form the basis of a healthy diet in adulthood
- To promote good eating behaviour, which is essential part of social development.

When to start solids?

The World Health Organisation revised its guidance in 2001 to recommend exclusive breastfeeding for the first six months of an infant's life. In 2001 the United Kingdom Scientific Advisory Committee on Nutrition (SACN) agreed that 'there was sufficient evidence that exclusive breastfeeding for six months is adequate'. The Department of Health (2004) has now clarified that 6 months is the recommended age for introduction of solid food for all infants, for both breast and formulae fed infants.

The Department of Health (2004) recommendations are:

- Breast milk is the best form of nutrients for infants
- Exclusive breastfeeding is recommended for the first six months (26 weeks) of an infant's life
- Six months (26 weeks) is the recommended age for the introduction of solid foods
- Breastfeeding (and/or breast milk substitutes, if used) should continue beyond the first six months, along with appropriate types and amount of solid foods.

General guidelines

As solids increase, the number and volume of breast/ formulae feeds will gradually decrease. Infants should never be forced to eat; the pace at which they will accept new foods will vary.

Infants need to be allowed to play and experiment with foods. The introduction of solids can be a messy process but this experimentation is important in developing taste and texture interest, as well as motor skills. An excessive fibre intake can be bulky and may impair absorption of nutritionally important minerals. High fibre, low fat diets are not recommended for infants (British Dietetic Association 2005). When solids are introduced at 6 months the movement from stage to stage will occur quicker, than solids introduced earlier i.e. at 20 weeks

First foods

Signs of readiness to move onto a mixed diet include an ability to sit up, showing an interest in solid foods, picking up food and putting it into his /her mouth, wanting to chew, the appearance of teeth and the infant appears to have an increase in appetite. A time should be chosen to suit both the mother and infant, when both are relaxed and the child is not too tired but is most hungry.

Small amounts of mashed vegetables or fruit should be offered so providing a balance of both savoury and sweet foods. Parents/carers should be encouraged to use home cooked foods rather than using tinned, packet or frozen manufactured foods.

Home produced mashed foods can be prepared by using a fork or similar utensil. Cooked foods for reuse should be placed in a sealed container in the refrigerator for no more than 24 hours, or alternatively foods should be frozen. Care must be taken to discard any unused portions of reheated foods.

Care and attention should be given to the washing of hands and equipment when preparing foods. It is recommended that new foods be offered one at a time in order to allow the infant to get used to new tastes. Mashed solids can be given by a spoon but they should never be added to a bottle.

Although milk feeding is recommended exclusively for 6 months, some parents may choose to start weaning

before this time and must be advised that there are many foods that should be avoided. These include foods which contain wheat, gluten, eggs, fish, shellfish, liver, citrus fruits, soft and unpasteurised cheeses.

More foods

Some babies manage better with their fingers rather than off a spoon. The giving of finger foods can encourage this practise. These include:

Slices of soft fruit – banana, pear, peaches and melon
Rice cakes
Pitta bread
Toast
Cooked pasta shapes
Cubes of cheese, tofu
Cooked vegetable pieces – green beans, broccoli, carrots, cauliflower, carrot, and courgette.

These foods may be sucked more than chewed at first. Supervision is always necessary to avoid the risk of choking.

Infants having a vegetarian diet can take a wider range of vegetables and fruits.

An increasing variety of foods may be offered as weaning progresses. Menus including meat, fish, wheat based and dairy products should be provided for the infant. These may be mashed, minced, in the form of soft lumps or finger foods.

Foods that commonly cause allergies (milk, eggs, peanuts, nuts, seeds, fish and shellfish) should be introduced slowly if there is a family history of eczema, asthma or hayfever.

Moreover, foods containing added salt or sugar, honey, tea and coffee, low fat foods, and nuts should not be given before the age of one to any child.

By six months, the infant's iron stores are becoming depleted. It is important to include some iron rich foods in the infants diet. These include:

Red meat (beef, lamb and pork)
Dark poultry meat (chicken legs and thighs, white meat such as chicken breast has less)
Fortified breakfast cereal
Dhal, lentils and hummus, and other pulses
Poppadums made with lentil flour (gram/channa flour)
Bhajis
Dried fruit (apricots, raisins and sultanas)
Green leafy vegetables.

The child should be included in family mealtimes. Children should be encouraged to use trainer cups and appropriate utensils.

From 9 months

At this time, the infant will move from minced or mashed to chopped foods. The variety of food accepted becomes more diverse. The number of milk feeds will be reduced by the increased food intake, so that by 12 months of age 550ml of full fat milk is taken daily. Breastfed infants may feed less frequently. Infants should be eating a mixed diet including three meals a day.

The Department of Health (2006) advise offering 3 to 4 servings of starchy foods each day (potato, bread, rice) and 3 to 4 servings of fruit and/or vegetables.

N.B *For vegetarian children the inclusion of nuts may provide an important source of protein into their diets. Whole or chopped nuts and seeds are not suitable for children under five because of the danger of choking, but they can be used if finely ground, for example in cooking or smooth nut spread. However many experts suggest avoiding nut products altogether in a small child's diet due to the risk of allergies developing. If there is a history of allergies or other atopic diseases in a family it is certainly best to avoid any nuts, especially peanuts, until at least three years.*

Key Messages

First foods

- First foods should be mashed or be in the form of soft lumps being given off a spoon. These may also be given in conjunction with finger foods.
- There are certain foods to be avoided.
- As solids increase, the number and volume of breast/formulae feeds will gradually decrease.

More foods

- Move onto minced foods and increasing amounts of finger foods.
- Greater variety of foods can be offered, including iron rich foods.
- There are certain foods to be avoided.
- Cows' milk can be used in food, but not as a main drink.

From 9 months

- Move from minced or mashed food to chopped food.
- The number of milk feeds will reduce and food intake will increase so that by 12 months 550ml of full fat milk can be taken as a drink or in foods.
- The Department of Health (2006) advise offering 3 to 4 servings of starchy foods and 3 to 4 servings of fruit / vegetables each day.

Commercial products sold for the purpose of the introduction of solids, may not necessarily conform to guidelines nor the stages detailed above.

Introducing solids to the preterm infant

The national guidelines on feeding infants during the first year are aimed at healthy term infants. These guidelines acknowledge that premature infants require separate advice.

Feeding can become a big issue for premature infants and a cause of anxiety and concern for parents/carers. Parents/carers are often unsure when to introduce solids. They should be encouraged not to make comparisons with other people's infants and reassured that their infant will develop at their own individual pace and need to be cared for as individuals.

BLISS (the premature infant charity) recommends that preterm infants should start on solids between 5 – 7 months from the infant's date of birth. Parents/carers should be encouraged to look for signs that their infant may be ready to start on solids e.g.

- The infant seems ready for something new
- The infant is showing interest when others are eating
- The infant is starting to put things to his/her mouth and is chewing on them
- The infant seems less satisfied on milk alone

Parents/carers should be encouraged not to introduce solids too early. The digestive system of the premature infant may not be developed enough to take solids before 4 months. In addition, giving solids too early may result in the infant taking less breast milk or infant formulae in favour of solids, which could result in poorer growth.

Infants begin to make early chewing movements from 5 months. It is important for the development of the mouth and jaw muscles that solids are introduced around the time that these chewing movements start. Infants are usually more willing to accept new tastes between the ages of 5 – 7 months. Delaying the introduction of solids can result in the infant being more suspicious of new tastes and delay their acceptance. An infant, who has been used to having semi-solids from a spoon by the age of 7 months, may accept the introduction of lumps better when they are introduced around the age of 9 months.

After starting on solids, premature infants should progress through the 'normal' stages of the weaning process, first foods → increasing variety → soft lumps → lumps → finger foods.

All infants should be offered lumps by 9 months of age. Lumps are usually tolerated around 2 months after starting the weaning process. If the infant is close to sitting up without help, playing with food with his/her fingers and putting it to their mouth, it is an indication that they are ready to be offered lumpier food. Before offering 'lumpy' food, the parents/carers should be encouraged to gradually thicken up the texture of pureed foods. (By adding less liquid or by adding some pure infant rice or potato to other dishes). If the infant tolerates this they should then be encouraged to offer soft but small lumps (solids are better accepted if the lumps are of similar size and texture). They infant can then slowly be introduced to lumpier textures/well mashed foods.

If the infant is slow to gain weight or the catch up growth is poor, the parents/carers should be encouraged to maximize the kilocalorie and protein content of the meals, once the mealtime routine has been established, e.g.

- Low birth weight formulae until the infant is 6 months old. Then change to high calorie infant formulae. Use this milk as a drink and to mix with solids where appropriate.
- Once established on solids, encourage good sources of protein, e.g. pureed meat, fish, pulses, cheese, or well-cooked egg.
- Add small amounts of butter, polyunsaturated margarine or vegetable oil to vegetables.
- Add a small amount of grated cheese to savoury dishes.
- Once the infant is established on three meals per day, offer savoury and desserts.
- Add double cream, full fat fromage frais or yogurt to fruits and desserts.
- If using shop bought weaning foods, parents/carers should be advised to choose those, which contain adequate protein. (Include savoury meals which contain 2.0 – 2.5g protein/100g, sweet meals at least 1 – 1.5g protein/ 100g.) If using powdered foods these values should be for the made up meal.

Diet 1 – 5 Year Olds

By the age of one year, children should be eating a mixed and varied diet from each of the four main food groups:

- Bread, other cereals and potatoes
- Fruit and vegetables
- Milk and dairy foods and
- Meat, fish and alternatives such as pulses (peas, beans and lentils), eggs, vegetable proteins and soya.

It is important that the under 5s get enough energy (kilocalories) and nutrients for growth and development. By eating a good variety of foods, including lots of fruits and vegetables, this should ensure they get all the other important dietary components they need.

While adults and older children should eat a diet that is fibre rich and low in fat, younger children on this sort of diet may not have the appetite to eat enough food to provide all the nutrients they need. Fussy eaters or small eaters should therefore be offered a good variety of food that they will accept.

A good appetite will usually make sure they get enough energy from the food they eat. However, there is evidence that the diets of children under 5 in Britain are low in the following:

- Vitamins A, C, iron and zinc, and children with darker skin pigmentation (particularly Asian children) are often low in Vitamin D.

Children's diets also contain too much of the following:

- The types of sugars that most contribute to tooth damage and
- Sodium, which can contribute to higher blood pressure

Sugars

Children do not need 'sugars' for energy. They can get all the energy they need from other carbohydrate foods e.g. bread, cereals, rice, pasta, potatoes.

The main concern about sugars relates to tooth decay. The sugars that occur naturally in foods such as milk, vegetables and fruit are not harmful to teeth and can therefore be consumed without concern. The sugars that cause tooth decay are those that have been extracted from plant sources. These include table sugar, sugar added to recipes, and sugar found in soft drinks and fruit juices. Tooth decay is positively related to the amount and frequency of these sugars in the diet, especially when they are consumed between meals.

Sodium

The majority of sodium in the diet is found in processed food. To ensure sodium levels are kept low, it is advisable to avoid processed food and reduce the salt used in cooking. (For example, not adding salt to sauces and homemade soups and choosing reduced salt varieties of tinned foods.)

Fibre

Fibre is important in preventing constipation and other bowel disorders and lowering blood cholesterol levels. The fears that high-fibre diets in under-5s will lead to growth-faltering and mineral imbalance in the developed world are not well supported by research studies and it is suggested that, with rising childhood obesity, increases in fibre may help to reduce energy intake. However, those children under 2 who are fussy eaters should not be given fibre-rich foods at the expense of energy-rich foods, which they require for adequate growth.

Vitamin D

Vitamin D status in pre-school children varies depending on the season of the year and a dietary supply of vitamin D is important to maintain vitamin D status during autumn, winter and spring in the North of England. Vitamin D is also available from body stores. However, adequate body stores of vitamin D depend on regular exposure of the skin to sunlight during the summer months.

The children at most risk of low vitamin D status and deficiency are those living in northern latitudes (which includes the North West) where there is inadequate sunlight for much of the year. In particular, children with darker skin pigmentation. This is because there is less synthesis of the bioactive form of vitamin D through the action of sunlight on darker skin.

The Department of Health recommends that all children up to the age of 5 receive vitamin supplements (vitamin drops) containing vitamins A, C and D. These vitamins are currently free to children up to 5 years old in low-income families through the Healthy Start scheme that has recently replaced the Welfare Food Scheme.

Under 5s of Asian origin are more likely to have lower vitamin D status, and a resurgence of rickets has been reported in many cities in the UK. Awareness of the risks of vitamin D deficiency should therefore be raised with all Asian families.

Further information can be seen in Appendix 1 – Dietary Reference Values for Nutrients.

Problem Issues

1. Constipation

Constipation is a common problem in childhood. It can develop for a number of reasons and not usually because there is anything physically wrong with the child. It is defined as difficulty or delay in passing a stool.

Constipation can be distressing for the child and family but it is not usually serious. Up to 10% of children are thought to suffer from constipation and about one third of 4 – 7 year olds are constipated at any one time. It occurs when the child does not pass a bowel movement often enough – less than three bowel movements a week is considered a risk factor for constipation. It often develops when the child begins to associate pain with passing a stool and then the child starts to withhold stools.

The normal frequency of passing stools is around four stools a day for the first week of life, declining to two stools a day at 2 years and once a day at 4 years. Breastfed infants vary between loose actions with every feed to no bowel actions for several days. It is important to ask parents/carers for a full history of their child's bowel habits to find out what is normal for their child.

Signs of constipation

- Fewer bowel movements than normal
- Pain and straining when passing stools
- Tummy ache
- Small, dry, hard stools
- Avoiding the toilet
- Sore bottom
- Unpleasant smell
- Dribbling urine
- Leakage of liquid stools
- No urge to defecate

Risk factors for constipation

- **Dietary factors** – not drinking enough water or eating enough fibre containing foods.
- **Holding in stools** – children can hang onto stools for too long if they are embarrassed to use a school toilet for example or because they are too busy playing.
- **Changes in daily routine** – such as going on holiday, moving house or changing a milk formulae.
- **Not enough exercise** – lack of physical exercise can cause a child's bowel to become more sluggish.
- **Constipation in your family** – if the parents/carers or other family members suffer from constipation this can increase the child's risk.
- **Medicines** – some medicines can cause constipation.

Treatment

- Identify the child's usual bowel habit and observe consistency.
- Look at the child's diet – try to include a variety of high fibre foods in the family's diet such as wholemeal bread, fruit and vegetables.
- Look at the child's fluid intake – encourage 6 – 8 glasses of water or juice a day.
- Encourage school children to take a bottle of water to school.
- For infants check the making of feeds, offer cooled boiled water in between feeds and try giving pureed fruit and vegetables on introduction of solids.
- Give the child plenty of time to go to the toilet, don't make them wait and encourage active play daily.
- Support the parents/carers throughout the whole episode of the child's constipation and continually encourage appropriate diet and fluid intake.

Medicines

Many children who are constipated may need some laxative medicines. This may be for a short time or it may be for several months. It is better to give medicines earlier rather than later, to give an effective dose and to monitor their effectiveness by a health professional. Many children are left for too long on ineffective doses of medicines or inappropriate medication. There is often temptation by the parents/carers to stop the medicines too early especially when things are going well. Ongoing support is essential.

The psychosocial impact of childhood constipation can be devastating. Self denial and attempts to keep it secret often mean a child has been constipated and maybe soiling for several months before health professionals are alerted. There is no 'quick fix' solution once the child is chronically constipated so the best solution is:

- Health education on diet and fluid intake from birth
- Early effective treatment with laxatives
- Awareness in health professionals of how devastating constipation can be for a family. Early referral for support is essential.

2. Colic

Colic is defined as 'inconsolable crying with limb flexure, lasting for at least 3 hours a day, at least 3 days a week in otherwise healthy, thriving infants starting in the first weeks of life and ceasing around 3 – 4 months of age'. Colic occurs in both breast and bottle-fed infants equally, and symptoms often emerge late afternoon and early evening. It is thought that colic affects 5 – 20% of infants, and is therefore a common problem.

The cause of colic is unknown, but factors thought to have an impact include maternal smoking, lactose intolerance, excessive gas and imbalances in intestinal micro flora.

Colic is not a serious condition, although it may cause stress within the family due to inability to cope with the constant crying, and sleep deprivation.

There is no proven cure for colic. However, several measures can be tried to help provide relief. It must be stated that none of these measures have been backed up by reliable evidence.

General advice to parents/carers/carers can involve:

1. Improving feeding technique by ensuring no air is ingested during feeding, and making sure the infant is winded properly both during and after feeding
2. Try to avoid force feeding by being relaxed at feeding times
3. Making sure that Mum's diet (if breastfeeding) is healthy and well balanced
4. Counselling and assistance for families to cope with crying
5. Special bottles and teats to help relieve colic are available. These often contain vents to expel excess air, or have a curved shape, or collapsible bags inside
6. Consider infant massage.

Elimination of lactose

It is believed that transient lactose intolerance may lead to colic. In breastfed infants, making sure that one breast is emptied before starting on the other can help, as foremilk contains more lactose than hind milk.

Colic drops utilise 2 different methods to manage colic. One type contains the enzyme lactase, which helps metabolise lactose. Others contain simeticone to relieve trapped wind. These can be added direct to the infant's bottle, or given to breastfed infants on a spoon mixed with expressed breast milk.

NB *There has been no evidence that any of these remedies help in treatment of colic.*

Probiotic drops are also available to buy (not on prescription) and recent studies have shown some benefit for these over simeticone-based remedies. Further research into this is being undertaken, but for now this should not be the main focus of treatment.

For those infants with a family history of lactose intolerance, low lactose and lactose free infant formulae are available. These should only be used short term, and infants need to be gradually weaned back onto normal feeds over a 1 week period.

There is no evidence that switching to a soya formulae reduces colic, and use of soya formulae in infants under 6 months is not recommended due to the high phytoestrogen content.

Elimination of cows' milk protein

If there is a family history of allergies and the previous techniques have not produced any results, it may be worthwhile trying to eliminate cows' milk protein from the infant's diet. Specialist formulae are available for this, but any switch to these formulae should be monitored by a healthcare professional.

Breastfeeding mums should continue to breastfeed, but mum herself could try a cows' milk free diet to see if infant's symptoms improve.

Comfort, by Cow & Gate, is a pre-thickened, partially hydrolysed formulae that contains 40% lactose and prebiotics. It was developed to help prevent wind, constipation, partial lactose intolerance and protein intolerance. Research has shown this may be of benefit to colicky infants. However, the product is not licensed for prescription and is highly modified, and as such would not be a useful tool for determining the cause of colic symptoms.

Herbal remedies

Some trials have shown that herbal teas such as fennel, chamomile and star anise can reduce the symptoms of colic. However, the studies were done on a small scale only, and the safety of these products for infants is not known. There is also the added drawback that giving large quantities of these herbal remedies in preference to formulae/breast milk could compromise nutritional status.

Key Messages

- Colic is a common problem, affecting up to 20% of infants, that usually resolves by 3 – 4 months of age.
- Dietary manipulation of either formulae or the diet of a breastfeeding mum tends to give the best results.
- Medications and herbal remedies are available, but there is little evidence for their efficacy, and safety of the infant is an important issue.

3. Diarrhoea

The most common cause of infant diarrhoea is gastroenteritis. The commonest cause of this is viral, and the commonest virus is Rotavirus. Bacterial gastroenteritis is less common; bacteria such as campylobacter, shigella, salmonella and E-Coli can be culprits. These can be identified by stool culture, as can less common infections such as giardia and cryptosporidium.

Diarrhoea and vomiting can also occur in children for less specific reasons, such as a response to illness, if this is suspected medical advice should be sought.

It is common for breastfed infants to have very soft faeces. Diarrhoea can also occur as a response to dietary changes, excitement or anxiety, and some medicines. It usually settles on its own, but it can cause problems if prolonged. Small infants and children can quickly become dehydrated if they lose too much fluid

Prevention of diarrhoea

In children under 1, some of the causes of diarrhoea can be prevented by making sure that all feeding equipment is properly cleaned and sterilised, and that clean water which is boiled and cooled is used for making up feeds. All instructions for making up feeds should be strictly followed. Other precautions include good hand hygiene e.g. washing hands before and after nappy changing, after visiting the toilet and before and after preparing food/infant milk.

Treatment of diarrhoea

Children with sudden onset diarrhoea should stop having solid food. Cooled boiled water or non-sugary fluids should be offered in small frequent volumes, for 4 – 6 hours. The child should then gradually be regraded back on to milk and solid foods. If the symptoms persist with the reintroduction of milk/food, only boiled water should be offered for a further period of 6 hours.

Children under the age of 1 may need to replace salts and water lost by using an oral rehydration solution, which is available from the pharmacy. Formulae fed infants should be given the solution only to drink in small frequent volumes for a period of 4 – 6 hours. Normal feeds should then be slowly reintroduced in small frequent volumes. If the symptoms persist with the reintroduction of infant milk, only rehydration fluid/ boiled cooled water should be offered for a further period of 6 hours.

For breastfed infants, normal breastfeeds should continue, but the rehydration solution given after each dirty nappy. If a breastfed infant will not take the solution from a bottle, it can be given instead from a teaspoon.

If infants refuse the rehydration solution, they should be offered small frequent drinks of boiled cooled water instead; the priority is to keep the infant hydrated.

When normal feeds resume, these should be given at full strength and not diluted. Extra scoops of formulae should not be added to the bottle at any time, as this can make dehydration worse.

The reintroduction of milk/food should be guided by the child's clinical symptoms and appetite however, if the child is vomiting and/or the diarrhoea persists for more than 12 – 18 hours (infants), 24 – 48 hours (children over 1) or if the child refuses to drink, has any signs of dehydration, has a high temperature or blood in the diarrhoea, the family should be advised to seek medical advice.

Medical treatment

Anti-diarrhoeal drugs should not be used in children except under medical supervision.

Toddler diarrhoea

Toddler's diarrhoea is the most common cause of chronic diarrhoea in children between the ages of 1 – 5 years. Symptoms include frequent watery stools containing undigested foodstuffs, in a child who is otherwise well, gaining weight and growing satisfactorily. Despite the children generally being well, parental anxiety is usually high. The diarrhoea tends to spontaneously resolve between the ages of 2 – 4 years.

The cause of toddler diarrhoea is unknown but is thought to be related to a rapid gut transit time and abnormal intestinal motility.

It is believed that non-absorbable sugars produced from clear fruit juices such as apple and grape juice may cause problems in sensitive individuals.

Treatment of toddler diarrhoea

- Parental reassurance
- Role of dietary manipulation is not evidence based, advice should include:

A. Excessive intake of fluid, particularly of fruit juices and squash should be discouraged
B. If parents/carers, to try and reduce symptoms have significantly reduced the child's fibre intake, advice should be provided to gradually normalise this
C. Symptoms appear to be worse in children who have low fat diets. If parents/carers have reduced their child's fat intake and are offering low fat products, they should be discouraged from doing this. Fat should provide 35 – 40% of the Kilocalorie requirements for children up until the age of 5 years. Practically, this means drinking whole milk and including foods such as yoghurts, cheese and other dairy-based products
D. If the parents/carers have tried excluding foods from the child's diet, believing the problem to be food intolerance, they should be advised to reintroduce these foods once the diagnosis of toddler diarrhoea has been established.

Key Messages

1. Sterilising, making feeds appropriately and good hand washing can prevent diarrhoea.
2. Beware of dehydration – give children plenty of plain fluids, and an oral rehydration solution if necessary.
3. Toddlers' diarrhoea is not serious, usually resolves itself and can be relieved by some simple changes to the diet.

4. Problem eating

Many children go through phases when they will only eat very small quantities or certain foods/food groups or when they refuse to eat anything at all. This is particularly common for children up to the age of 5 years.

Children's eating patterns often cause concern for their parents/carers e.g.

- Is their child eating too much or too little of a certain food?
- Is their child's diet nutritionally adequate?
- Are they getting sufficient nutrients to grow and develop normally?

Children very readily pick up on parental anxieties around mealtimes and unfortunately this may cause the problem to last longer than it otherwise would have done. In reality, although it can be worrying for parents/carers, only a few

of the large amount of children with problem eating go on to have problems with weight gain and growth. For the majority of children the phase will be short lived and their diet will naturally improve.

Children who present with prolonged "problem eating", should be monitored regularly and their growth plotted. Basic feeding problems are reported to be the most common factor in children with faltering growth. *(Children's Society 2002)*

When to seek further help?

If a child's growth drops through 2 centile spaces once established on full feeds /diet, please refer to a paediatrician for further investigation.

Eating problems in children have been classified in the following ways by the Royal College of Psychiatrists.

Selective eating (extreme faddiness)

- Narrow range of foods is eaten. Usually for at least 2 years.
- These children are unwilling to try new types of food.
- The child's behaviour is normal, unless they feel that they are being forced to eat a wider range of foods that they feel comfortable with.
- Children who eat only a restricted sugary diet may have problems with their teeth. The weight of these children is not indicative that there is a problem.

Restrictive eating

- These children eat smaller amounts of food than they should do for their age.
- The range of food eaten is varied and as expected for a child of their age.
- Often other members within the family will have a history of a similar eating pattern.
- The child's height and weight may be less than expected for their age.

Food refusal

- Most common in pre-school children, where the refusal can be used as a way to get other things.
- These children will eat their favourite foods without any problems.
- They may refuse food only when they are with particular people or in a particular situation e.g. refusing to eat at home but eating normally at nursery.
- Child is usually of normal height and weight.

Inappropriate texture of food for age

- Refusal to eat any solid food that requires biting and chewing.
- These children also tend to spit out the food, gag or refuse to eat it if it contains lumps.
- They may also refuse to eat finger foods.
- Majority of these children are normal weight, but some may be underweight.

Parents/carers need to be encouraged in the following ways:

- Offer regular meals and snacks and encourage mealtime routines. No food should be offered at other times. This is better than letting the child "pick" throughout the day
- Meals and snacks to be eaten in a highchair where possible, and parents/carers should be encouraged to eat at the same time as their child. This will help to develop social interactions at mealtimes and make them an enjoyable occasion
- Ensure their child is not filling up on fluids by having excessive amounts of milk or juice.
- Avoid offering numerous meal replacements, when foods are refused
- Use brightly coloured plates, and cups
- Turn the TV off – children are easily distracted
- Eat in a calm and relaxed environment
- Keep meal times to about 20 - 30 minutes; avoid rushing meals while not letting mealtimes drag on for too long.

A child lets you know they have had enough to eat when they:

- Turn their head away
- Push the bowl or plate away or onto the floor
- Scream or shout
- Spit food out repeatedly
- Holds food to their mouths but refuses to swallow.

In addition parents/carers needs to be encouraged to control their own behaviours in what can often be difficult and frustrating situations by:

- Not showing they are worried or annoyed by their child's behaviour
- If their child is refusing to eat, take the food away without any comments
- If their child stops eating at a meal, try once to encourage them to take a little more
- Praise good mealtime behaviour and any small improvement in food intake
- Children respond well to encouragement and congratulations
- Rewards may be used such as trips to the park or extra play time together
- Rewards should never be given as food treats.

When planning meals for children who are "problem eaters", parents/carers should be advised to do the following:

- Give small portions of foods at mealtimes – don't over face the child. If these are finished offer more
- Offer finger foods, or foods which the child finds easier to manage themselves
- Do not take a meal away and replace it with another choice if the first one is refused

- Avoid snacks and drinks at or close to mealtime
- Offer foods the child is likely to eat
- Avoid offering new foods when a child is being fussy or refusing foods
- As food intake improves, start to introduce new foods.

5. Overfeeding

Overfeeding can lead to excess weight gain and should be avoided as it can lead to obesity in later life. Frequent symptoms of overfeeding include gastro-oesophageal reflux (GOR) and vomiting.

Introduction of solids, as a general rule should not be commenced before 4 months of age as this can lead to overfeeding. Exclusive breastfeeding or infant formulae feeding however, is recommended for the first six months of an infant's life.

The infant should be assessed as to whether he or she is genuinely hungry. As a rule, infants can be depended upon not to take excessive quantities of feed. Food should not be 'pressed' onto the infant. If the food doesn't seem to be wanted, wait and try again later.

Regular weighing, ideally at 4 week intervals (but not more often than two weekly), use of percentile charts and careful questioning of feeding regime will indicate if the infant is overfeeding. Also check bowel habits and consider any malabsorptive symptoms.

Overfeeding in bottle fed infants, (e.g. more frequently that two hourly) may be reduced by:

- Offering cooled boiled water between feeds
- Distracting/ playing with the infant to extend the period between feeds.

In the bottle fed infant, the method of making up the feed should be checked.

Solids should NEVER be added to bottle feeds.

Frequent feeds are only a cause for concern if:

- The infant is overweight
- The infant is vomiting/regurgitating frequently.

Overfeeding is unlikely in breastfed infants.

6. Faltering growth

Faltering growth occurs when infants and children fail to gain weight at the 'normal' rate.

It is defined as:

- Weight deviating from the height centile
- Weight persistently 2 centile spaces below the height centile.

Faltering growth affects 5% of children under 5 years of age and in over 90% of these children there is no medical cause.

Faltering growth is the result of an inadequate kilocalorie intake to meet nutritional requirements, it occurs across all socio-economic groups and neglect/abuse occur in only a tiny minority of cases. The most common reported factor in all cases is 'basic feeding problems'.

Children grow extremely fast in the first 2 years of their life. At birth infants need 3 – 4 times the adult kilocalorie requirement per Kg body weight; at 1 year of age they need 2 – 3 times the adult requirement. Therefore any circumstance that reduces the 'normal infant feeding pattern' may result in a reduced food/milk intake and thus faltering growth.

Referring to centile charts can help to assess adequate weight gain and growth. All infants should have their weights and lengths plotted accurately in their individual child health records (red books).

N.B *A single measurement of weight must never be used in isolation; weight trends must be viewed when assessing child growth.*

If there is any concern regarding the child's weight gain, he/she should be weighed naked on the same scales at periods of not more than 2 weeks and ideally at 4 week intervals as recommended by the Child Growth Foundation (1996).

Children should be weighed in Kg; this can be converted to empirical measurements if the parents/carers request this. Length should be measured in centimetres; the child should be measured lying until they reach an age when they can stand up. Height should be measured without shoes and preferably using a stadiometer. Premature infants should have their measurement plotted using their corrected age until their actual age is 2 years.

A child whose weight is consistently less than the 0.4th centile, but is gaining weight well (when plotted is running parallel to the 0.4th centile), is unlikely to require further assessment. A child whose weight falls and crosses more than 2 centile spaces will almost certainly require further investigation. Actual weight loss without obvious cause should always be monitored and investigated if it persists. Investigation is necessary to exclude any medical reason for the faltering growth.

When assessing faltering growth, full knowledge of the child's past history and background is required, including:

- Weight history, centile chart
- Family history – genetic/familial, psychological and social
- Diet and pattern of eating
- General health, sleep pattern and level of activity
- Medical conditions and medication (any signs of vomiting, GOR or malabsorption)
- Neglect – physical and/or emotional
- Parental concern.

Parents/carers as a rule are accurate observers of their child's behaviour. Parental concerns should be taken seriously.

Simple questioning of the parent may reveal the nature of the feeding difficulty:

- What is the child offered to eat/drink? (meals & snacks)
- What do they actually take?
- Times of day and night, when food/fluid is offered?
- Are drinks from a bottle, should they be from a cup?
- What volume of milk is the child having?
- Is the food texture age appropriate?
- Is the child self feeding, should they be?
- How long do the meals last?
- Where is the child fed?
- Have mealtimes become anxious times?

Management of faltering growth:

The advice given to parents/carers should be supportive, non judgemental, solution focussed and parent led. The information should be concise, consistent, practical, affordable and easy to do.

Some suggestions for parents/carers may be to:

- Provide appropriate foods, which are energy dense
- As food intake improves, introduce new tastes with familiar favourites
- Offer food that the child is likely to eat
- Establish regular timed meal and snack routine, avoid grazing. A child who continually snacks will not be hungry at mealtimes
- Avoid force feeding; ignore negative behaviour and food refusal. If new food is rejected, try to introduce again a few weeks later
- Avoid conflict; ensure meals are an enjoyable experience. Attractive plates and utensils may help
- Encourage social interaction at mealtimes, eating in highchair or appropriate seating.
- Praise good behaviour and any small improvement in food intake
- Avoid offering lots of choice or numerous meal replacements when food is refused
- Limit time at mealtimes to 20 – 30 minutes
- Avoid withdrawing food as a punishment or offering snacks as rewards.

Key Messages

- All children should be weighed and measured accurately and the results plotted on the centile charts in their child health records.
- When faltering growth is suspected a full history and assessment should be conducted. A medical referral for further investigations should be undertaken if the child is losing weight and has crossed 2 or more centile spaces.
- When providing parental advice, the professionals' role is essentially a supportive and educative role. If the child's eating does not improve after giving first line management advice or if weight gain does not improve, it is recommended that the child should be referred to a consultant paediatrician.

Useful resources:

"Help My Child Won't Eat" - Paediatric Group of BDA

"My Child Still Won't Eat" - Paediatric Group of BDA

7. Food allergy and intolerance

The prevalence of food allergy and intolerance is on the increase but the reasons why are unclear. The increase may be genuine or it may be that our awareness of the condition has improved. It is thought that around 15% of children are affected by adverse reactions to food.

Food intolerance is a term used to describe a whole range of adverse reactions to food, including allergies, enzyme deficiencies and autoimmune effects.

A true food allergy is an immediate and sometimes severe reaction by the body, to a protein found in a particular food, e.g. cows' milk protein, egg, wheat or nuts. The allergic response produces IgE antibodies, which make the infant/child feel ill, immediately after consuming the food. True allergy is thought to affect 2 – 8% of children.

Children may be intolerant to certain foods because of bowel disorders e.g. coeliac disease, (where the small bowel lining is sensitive to gluten) or disaccharide intolerance, (where the small bowel lining has a shortage of an enzyme), e.g. deficiency of lactase results in lactose intolerance. These conditions result in malabsorption, diarrhoea and faltering growth.

There are reliable tests for diseases such as coeliac disease and disaccharide intolerances. Although skin and blood tests for allergy can be carried out, they show poor correlation with clinical symptoms, especially in young children. If there is firm clinical evidence of food allergy/ intolerance, the child should be referred to a Paediatrician. The diagnosis can only be confirmed by putting the child on an exclusion diet, under the supervision of a dietitian. A child's diet should never be restricted unnecessarily.

Cows' milk protein intolerance (CMPI)

This is the most common cause of food allergy and intolerance in children. The prevalence is thought to be between 2 – 8% for allergy, with up to 15% of infants showing intolerance.

Signs and symptoms of CMPI can include vomiting, diarrhoea, gastro-oesophageal reflux, colic, atopic eczema and faltering growth. Diagnosis can only be made by eliminating cows' milk protein from the diet, followed by subsequent challenges.

Infants who are intolerant to cows' milk protein need a safe, effective and nutritionally adequate milk substitute. The type of milk substitute chosen will depend on the age, severity of the intolerance and specific requirements of the child.

For breast fed infants with signs of allergy, the mother should be encouraged to continue breast feeding but to consider changing to a dairy free diet.

Soya infant formulae

These infant formulae are based on soya protein isolates and have to conform to strict guidelines. The formulae are nutritionally complete and are suitable for cows' milk protein intolerance and lactose intolerance. **However**, concern exists over the phytoestrogen content and risk of soya protein intolerance. It is recommended that these formulae are **not used in infants aged less than 6 months**. In January 2004 the chief medical officer advised that soya based infant formulae should **not** be used as a first choice for the management of infants with proven cows' milk protein intolerance or lactose intolerance. The Chief Medical Officer advises that soya based products should only be used in exceptional circumstances to ensure adequate nutrition, for example infants of vegan parents/ carers who are not breast feeding or in infants who cannot tolerate the alternatives.

Examples of soya infant formulae include

Infasoy (Cow and Gate),
Wysoy (SMA Nutrition),
Farley's Soya,
Prosobee (Mead Johnson),
Isomil (Abbott Nutrition).

For older children soya drinks can be purchased directly from supermarkets and health food shops. These are low in energy and are unsuitable for children under 1 year of age. Flavoured calcium enriched soya drinks, which are available in 200ml cartons can be useful for older children in nursery or school. It should be noted that these can contain simple sugars and caution should be used.

Extensively hydrolysed formulae

These formulae are widely used as first line infant milk substitutes. They are based on cows' milk protein, which has been partially hydrolysed to small peptides. These are nutritionally complete, Advisory Committee for Borderline Substances (ACBS) prescribable, well tolerated, and produce normal growth. These products are not recommended in infants who have severe CMPI who continue to have evidence of clinical symptoms when given partially hydrolysed formulae and residual allergenicity has been demonstrated.

Examples of hydrolysed formulae include

Pepti (Cow & Gate) - not lactose free
Pepti-Junior (Cow & Gate),
Nutramigen 1 & 2 (Mead Johnson),
Pregestimil (Mead Johnson),
Prejomin (Milupa),
Pepdite (SHS).

Amino acid formulae

Currently there is only one amino acid based formulae in the UK – Neocate /Neocate Advance (SHS). This is based on cows' milk protein, which has been extensively hydrolysed to amino acids. This formulae is nutritionally complete, well tolerated, and expensive but ACBS prescribable. It is very useful in the management of severe CMPI and is successfully used to treat infants who suffer from protein hydrolysate or soya intolerance.

Animal milk

Goats' and sheep's milk have historically been used in the management of cows' milk protein intolerance. They are both nutritionally unsuitable (low in folic acid, vitamins B6, B12 and C), if given in unmodified forms to infants under 1 year of age and they contain lactose. Goats' and cows' milk share similar allergens and there is a strong cross-reactivity between cows', goats' and sheep's milk. They should not be routinely used in the management of cows' milk protein intolerance.

The Department of Health (August 2006) advises that health care professionals do not recommend the use of infant milks based on goats' milk protein as a source of nutrition for infants. Current European legislation does not permit the use of goats' milk protein in infant formulae therefore from 1st March 2007 it can no longer legally be sold in the UK.

Cereal drinks

In the UK there are 2 cereal-based drinks, one made from oats and the other from rice. These milks are of little nutritional value and are unsuitable for infants under the

age of 1; they should not be used as a main substitute for cows' milk. They can however be used in cooking for children with multiple food intolerances over 1 year of age, to make the diet more palatable.

Nut milks

Nut milks such as almond and coconut are commercially available. Again, these are of little nutritional value and are unsuitable for infants under 1 year of age; they should not be used as a substitute for cows' milk.

Lactose intolerance

Lactose intolerance may be primary; an inability to produce the lactase enzyme or secondary, which is more common, the result of damage to the gut wall.

Secondary intolerance may occur with or following conditions such as coeliac disease, CMPI, or gastroenteritis. In this case a suitable lactose free formulae should be used and major sources of lactose in the diet should be avoided (milk, milk puddings, cheese, chocolate). Most other dairy products and foods containing small amounts of lactose are tolerated. Intolerance following gastroenteritis usually resolves within 6 - 8 weeks. Cows' milk formulae may then be reintroduced.

There are three low lactose formulae available that are ACBS prescribable for proven lactose intolerance

SMA LF
Enfamil Lactose free
Galactomin 17.

These are all derived from milk protein, are nutritionally complete but contain only traces of lactose. They are unsuitable for cows' milk protein intolerance.

N.B *When introduction of solids starts all cows' milk products including butter, cheese, yogurt, cream etc need to be avoided. Processed foods containing casein, whey, lactose, non milk solids need to be avoided. Advice should be sought from a paediatric dietitian to ensure the infant's diet is nutritionally adequate.*

Infant milk formulae such as those above which do not contain lactose, have either glucose or maltodextrin as the carbohydrate source. They are therefore potentially more likely to cause dental caries than standard infant milks. Parents/carers should be advised not to let their children comfort feed from a bottle and children encouraged to use a cup from an early age.

Gluten free diets

Children with Coeliac disease or Dermatitis Hepatiformis require a gluten free diet. A gluten free diet involves avoiding all foods, which are made from wheat, rye, barley and oats. Gluten free products such as bread, crackers, biscuits, pizza bases and pasta are available on ACBS prescription.

N.B *A gluten free diet should not be adopted without the advice and support of a registered dietitian.*

Nut free diets

Some infants and children are allergic to nuts or seeds. Peanut allergy appears to be increasing among children.

Children who face the highest risk of nut allergy are those with parents/carers, brothers or sisters who suffer from allergic conditions such as asthma, eczema, or hay fever.

If an infant is in this high risk group:

- Mums should be advised to avoid eating nuts whilst breastfeeding
- Avoid giving peanuts, foods containing peanuts (e.g. peanut butter) or unrefined peanut oil (groundnut oil), until the child is at least 3 years old
- Always check ingredients list of product, if in doubt, avoid the product. Since November 2005 food labelling law dictates that all pre packed food sold in the UK must show clearly on the label if it contains nuts.

Intolerance to food additives

A food additive is any substance intentionally added to food for a specific function, for example to preserve or colour it. All food additives, whether they are natural or artificial, must go through rigorous safety assessment and approval procedures, and must comply with European Union (EU) legislation. They are only allowed to be used if experts decide that they are necessary and safe.

However, some people can react to certain additives, just as some people react to certain foods. People who react to additives normally have asthma or other allergies already. Reactions to additives usually bring on an asthma attack or cause nettle rash (urticaria). The additives that most commonly cause these symptoms are Sulphites, Benzoates and Tartrazine.

Some people think that certain food additives, especially artificial colours, can cause hyperactivity in children. Hyperactivity is a general term used to describe behavioural difficulties affecting learning, memory, movement, language, emotional responses and sleep patterns. It is also thought by some that there could be a connection between certain food additives and attention deficit hyperactivity disorder (ADHD). At the moment there isn't enough scientific evidence to say if there is a connection between certain food additives and hyperactivity or ADHD in children. And there could be many different causes of hyperactive behaviour. Further research is being conducted in this area.

When additives are used in food, they must be declared in the list of ingredients, either by name or E number, so if people would like to avoid certain additives, they can do this by checking the label.

Key Messages

- If there is firm clinical evidence of food allergy/intolerance, the child should be referred to a Paediatrician. Foodstuffs should not be restricted unnecessarily. The child should be referred to the dietitian for a dietary assessment and to ensure the family receive appropriate advice.
- Cows' milk protein intolerance is the most common intolerance seen in infants and children. The choice of milk replacement will depend on the age and severity of symptoms. Protein hydrolysate or amino acid formulae should be used as first line management in infants. Soya formulae, goats' and sheep's milk and cereal based milks are contraindicated.

Iron

Iron is an integral part of many proteins and enzymes whose purpose is to maintain good health. It is crucial in the transportation of oxygen and for the regulation of cell growth. The World Health Organisation (WHO) consider iron deficiency anaemia to be the number one nutritional disorder in the world, estimating that approximately 80% of the population may be deficient.

Potential effects of iron deficiency in children include:

- General fatigue
- Impaired immunity
- Slow cognitive and social development
- Reduced school performance (Nutrition Committee, Canadian Paediatric Society 1991).

Groups at risk in childhood

- Premature infants
- Low birth weight infants
- Toddlers
- Children suffering frequent infections
- Faddy eaters

Groups needing targeted advice

- Vegetarians
- Ethnic minority groups
- Infants with excessive tea intake
- Infants who have been weaned early
- Pro-longed high milk intake (breast, formulae or fresh cows' milk)
- Children with poor fruit and vegetables intakes e.g. less than 2 servings a day

Dietary advice

There are two forms of dietary iron.

Haem Iron	found in animal foods e.g. red meat, fish and poultry. Iron found within this group is more easily absorbed by the infant.
Non-haem iron	found in plant foods, particularly dark green vegetables, legumes (pea and bean family) and lentils. These require vitamin C for absorption.

Below is the iron content of some iron containing foods.

Red Meat

2 slices of lamb's liver	8.0mg
Average portion of meat curry	7.9mg
Average portion of minced beef	6.2mg
Average portion of cottage pie	3.6mg
Average portion of lasagne	3.2mg

Fish

Kipper fillet	1.8mg
1 Sardine	1.2mg

Cereals

2 Weetabix	3.0mg
3 Tablespoons of muesli	2.6 mg

Bread

1 Slice wholemeal bread	0.9mg
1 Slice white bread	0.5mg

Beans and Pulses

Small tin baked beans	3.2mg
3 Tablespoons red/black dahl	1.3mg
2 Tablespoons hummus	1.1mg

Vegetables

Average portion of spinach	1.4mg
Average portion of broccoli	1.0mg

Factors affecting iron absorption

Iron absorption can be affected both positively and negatively.

Positive factors	Negative factors
Including Vitamin C at meal times.	Over use of tea as a drink (iron absorption is inhibited by tannin). High intake of bran. Early introduction of phosphate (unmodified cows' milk). Introduction of mixed feeding before six months in breast-fed infants High phytate containing foods, such as cereal fibres.

Recommend levels of dietary iron

Recommend levels of dietary iron mg/day		
Age	**Male**	**Female**
7 – 12 months	11	11
1 – 3 years	7	7
4 – 8 years	10	10

Birth – 6 months

Newborn infants have approximately 75mg/kg of body iron. Their blood volume is tripled in the first year and will need 0.4 – 0.6 mg of daily iron in order to maintain their iron stores, which will begin to deplete after 6 months (Duncan et al 1985).

Breast milk contains iron, which is very well absorbed by the body, more so than that contained in iron fortified infant formulae.

Cows' milk contains little iron, which is not only poorly absorbed but also compromises the absorption of dietary iron and can result in bleeding from the gastro-intestinal tract, if cows' milk protein intolerance is present.

Iron supplementation

Premature and low birth weight infants have a lower level of body iron, approximately 64mg/kg. Their requirements postnatally are higher than full term infants because they experience more rapid post natal growth. Supplements, as directed by a medical practitioner, may be indicated in order to prevent the onset of anaemia.

Key Messages

- Iron in breast milk is very well absorbed and this supports breast-feeding as the recommended milk for newborn infants.
- Early introduction of solids can negatively affect iron absorption and should therefore be discouraged.
- At six months a diet containing iron rich foods should be encouraged. Examples include:
  - Meat
  - Poultry
  - Fish
  - Lentils
  - Legumes (peas and beans)
  - Dark Green vegetables
  - Iron fortified cereals.
- Cows' milk should not be introduced under age one year as a drink.

Practitioners should discourage the inclusion of foods and drinks, which negatively affect iron absorption. These include:

- Tea
- Cows' milk (under 1 year old)
- Low dense snacks e.g. crisps, desserts and sugar sweetened drinks
- High fibre intake
- Excessive milk intake – over 1 year old (breast or cows' milk).

Vitamins

Breast fed infants

Healthy full term infants fed adequate breast milk from a well-nourished mother do not require vitamin supplements.

Infants of breastfeeding mothers whose diet/nutritional status is poor should be recommended to give the infant vitamin supplements from the age of one month and the mother encouraged to meet her nutritional needs.

Infants who are breastfeeding after 6 months should have vitamin drops containing A, C and D (Birth to Five 2006).

Healthy start children's vitamin drops

Under Healthy Start, children can get free vitamin supplements from when they are six months old until their fourth birthday.

The daily dose of five drops contains:

233 ug Vitamin A
20 mg Vitamin C
7.5 mg Vitamin D_3

Formulae fed infants

Healthy full term infants receiving more than 500ml of infant formulae do not require vitamin supplements. Extra vitamins are already added during manufacture.

If infants are receiving less than 500ml of formulae per day it is advised that they receive vitamin supplements (Birth to Five 2006).

Children aged 1 to 5

The Department of Health currently recommends that all children should receive vitamin drops from the age of 1 – 5 years. Children particularly at risk are those who are fussy eaters, those who live in northern areas of the UK and children from Asian, African and Middle East origin (Birth to Five 2006).

For children aged 1 – 5 years there is no need to give other more complex multivitamin and/or mineral preparations unless they are on a special or therapeutic diet and is has been advised by a doctor or registered dietitian (Scottish Executive 2006)

Key Messages

- Infants who are breastfeeding after 6 months should have vitamin drops containing A, C and D (Birth to Five 2006).
- It is recommended that children over the age of one receive vitamin drops in Central Lancashire, as there is such a diverse population.

Obesity

According to the Department of Health, the prevalence of obesity is increasing among adults, children and young people. Around 16% of 2 to 15 year olds and 23% of women are obese. Children who are overweight or obese in childhood have a much greater chance of remaining so in adulthood, particularly if at least one parent is overweight and/or they are from a lower socio-economic group.
The prevention of obesity in both children and adults is important because it is linked with ill health, including hypertension, heart disease, and type 2 diabetes (including the onset of type 2 diabetes in childhood), psychological problems including low self-esteem.

Raising the issue of weight in children and young people

1. When to initiate a discussion about weight
- If the family expresses concern about the child's weight.
- If the child has weight-related co-morbidities.
- If the child is visibly overweight.

2. Raise the issue of overweight
Discuss the child's weight in a sensitive manner because parents/carers may be unaware that their child is overweight. Use the term 'overweight' rather than 'obese'. Let the maturity of the child and the child and parents/carers' wishes determine the level of child involvement.

If a parent is concerned about the child's weight:
'We have [child's] measurements so we can see if he/she is overweight of his/her age.'

If the child is visibly overweight: 'I see more children nowadays who are a little overweight. Could we check [child's] weight?

If the child presents with co-morbidities: 'Sometimes [co-morbidity] is related to weight. I think that we should check [child's] weight.'

3. Assess the child's weight status
Refer to UK Child Growth Charts and plot BMI centile. Explain BMI to parent: e.g.

'We use a measure called BMI to look at children's weight. Looking at [child's] measurements, his/her BMI does seem to be somewhat higher than we would like it to be.'

If the child's weight status is in dispute, consider plotting their BMI on the centile chart in front of them. In some cases this approach may be inappropriate and upsetting for the family.

Overweight	Severely overweight
BMI centile	**BMI centile**
>91st centile	>98th centile

NICE Guidance 2006

4. Assess seriousness of overweight problem and discuss with parent
If child is severely overweight with co-morbidities, consider raising the possibility that their weight may affect their health now or in the future.

This could be left for follow-up discussions or raised without the child present as some parents/carers may feel it is distressing for their child to hear.

'If their overweight continues into adult life, it could affect their health. Have either you [or child] been concerned about his/her weight.'

Consider discussing these points with the parent at follow up:

- **Age and pubertal stage:** The older the child and the further advanced into puberty, the more likely overweight will persist into adulthood.
- **Parental weight status:** If parents/carers are obese, child's overweight is more likely to persist into adulthood.
- **Co-morbidities:** (see overleaf) increase the seriousness of the weight problem.

5. Reassure the parent/child
If this is the first time that weight has been raised with the family, it is important to make the interaction as supportive as possible:

'Together, if you would like to, we can do something about your child's weight. By taking action now, we have the chance to improve [child's] health in the future.'

6. Agree next steps
Provide patient information literature, discuss as appropriate and:

- If overweight and no immediate action necessary: Arrange a follow-up appointment to monitor weight in three to six months:

'It might be useful for us to keep an eye on [child's] weight for the next year.'

- If overweight and family want to take action: Monitor child's weight and raise again in six months to a year.

- If overweight with co-morbidities: Consider referral to secondary care:

'It might be useful for you and [child] to talk to someone about it.'

Background information

Identifying the problem

Ascertaining a child's weight status is an important first step in childhood weight management. Parents/carers who do not recognise the weight status of their overweight children may be less likely to provide them with support to

achieve a healthy weight. In a British survey of parental perception of their child's weight, the overwhelming majority (94%) of parents/carers with overweight or obese children misclassified their child's weight status. Given this low level of parental awareness, health professionals should take care to establish a child's weight status in a sensitive manner.

Assessing weight status in children

This child growth charts for the UK allow easy calculation of BMI based on a child's known weight and height. Measurements of body fat in children can also be a useful way of assessing a child's weight status. Details of body fat reference curves for children are now available, although, in practice, body fat cannot be assessed without the necessary equipment.

Assessing the severity of the problem

A number of factors are known to increase the risk of childhood obesity and the likelihood that a weight problem will persist into adult life. Considering these factors will help you to make an informed decision about the most appropriate mode of action:

- The older the child, the more likely it is that their weight problem will continue into later life and the less time they have to 'grow into' their excess weight
- A child is 20 – 40% more likely to become obese if one parent is obese. The figure rises to around 80% if both Parents/carers are obese
- While weight problems can lead to psychological issues such as depression and low self-esteem, weight loss may not necessarily resolve these problems, so don't rule out referral to CAMHS.

Importance of weight management

For many overweight children, prevention of further weight gain is the main goal because as long as they gain no more weight, they can 'grow into' their weight over time. This goal can be achieved through lifestyle changes:

Key Messages

- Improving the diet, e.g. by increasing fruit and vegetable consumption, reducing fat intake and portions sizes, considering intake of sugary drinks, and planning meals.
- Increasing activity, e.g. playing football, walking the dog.
- Reducing sedentary behaviours such as time spent watching TV or playing computer games.

If the child is more severely overweight, or has already reached adolescence, 'growing into' weight is more difficult and weight loss has to be considered.

Need to offer solutions

Unless the child is severely overweight with co-morbidities, be led by the parents/carers and/or child's wishes.

Encourage action if appropriate. Health professionals should be ready to offer referral support so that they are seen as taking the issue seriously. If the child is very overweight and has co-morbidities, the child (and family) may require on-going support despite referrals, e.g. through continued weight monitoring, additional specialist referrals, or help with family-based lifestyle modification.

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www.multiplebirths.org

British Dietetic Association
www.bda

British Dietetic Association
www.bda.uk.com

Little Angels – Breastfeeding support
www.littleangels.org.uk

La Leche League
www.laleche.org.uk

Breast Feeding Network
www.breastfeedingnetwork.org.uk

Central Lancashire PCT
www.centrallancashire.nhs.uk

APPENDIX 1

Nutrients: functions, sources & requirements

- This table is about the nutrients in food. Eating a healthy balanced diet, including all of the food groups will provide all the nutrients and energy toddlers need (apart from vitamin D in some cases).

- Most toddlers have body stores of all these nutrients and poor eating for a day or two will not deplete them of any. Over a week or so toddlers' nutritional intakes will usually average out and cover their full needs.

- This table is not a guide to what toddlers should eat but summarises in what foods nutrients can be found, what they do, how much of them is needed and the signs of nutrient deficiencies or excess. The nutrient requirement of toddlers are expressed as a reference nutrient intake (RNI), a term that is explained further on.

Dietary reference values for nutrients

The terms below appear on the labels on foods and drinks, and on vitamin and mineral supplements. They are also used by public health bodies, government and other agencies, to define nutritional requirements. Collectively they are called 'dietary reference values' (DRV).

RNI 'Reference Nutrient Intake' is the amount recommended per day for any age group to make sure they all get enough.

EAR 'Estimated Average Requirement' is the average needed for a defined age group.

LRNI 'Lower Reference Nutrient Intake' is the amount below which most people in a defined age group will be deficient.

RDA 'Recommended Daily Amount' is used for the whole population but **should not be used for toddlers and young children as it applies to adults.**

Nutrient	Function in the body	Food sources which toddlers enjoy	Daily requirement (RNI) for 1 – 3 year olds	Signs of deficiency or excess in toddlers
Protein Made up of, and is a source of, peptides andamino-acids.	Provides structure for all cells in the body, enzymes and carrier molecules. Growth increases requirement as extra protein is needed for new muscles and other cells.	Richest sources are milk, yoghurt, meat, fish, eggs, ground and chopped nuts and peanut butter – see back page for caution with peanuts and whole nuts*. Good sources are pulses such as dhal, lentils, baked beans, hummus and other starchy beans: chick peas, butter beans and red kidney beans. Cereals and foods containing flour such as bread, chapatti and pasta also provide some protein.	14.5g/day.	Deficiency of protein alone is rarely seen in the UK. Poor growth and development would result. Muscle wasting is a sign of severe protein deficiency although it can have other causes.
Carbohydrate May be 'simple' sugars, such as sucrose and glucose, or 'complex' such as starches and some fibre. Fructose is the sugar in fruit and honey. Lactose is the sugar in milk.	Provides energy (kilocalories).	Potatoes, yam, breakfast cereals, couscous, rice and any foods containing flour such as bread, chapatti, pasta, pastry, biscuits and cake. Fruit, honey and milk. Milk puddings such as sago, and tapioca as well as rice. Foods containing refined sugar such as sweet drinks and foods e.g. Puddings and sweets.	No RNI. Requirements depend on activity and how much fat is eaten.	Insufficient energy (kilocalories) from carbohydrate (and fat) causes poor growth and development. Faltering growth due to low calorie intake is not uncommon in the UK. Excess carbohydrate intake can cause obesity. Excess and frequent intake of simple sugars can cause dental caries. In the UK about 10% of toddlers have dental decay.
Fat Sometimes called 'lipid', and is made up of: 1. Fatty acids which may be short, medium or long chains of: • saturated • mono unsaturated • polyunsaturated including omega 3 & Omega 6. Complex fats e.g. Cholesterol and phospholipids.	Provides energy. The membranes of all cells are made of lipids, including those of all nervous system. The omega 3 and 6 fats are essential for brain and nerve function and healthy skin. Transport of fat soluble vitamins.	Oils and fats used to fry foods. Butter, margarine and other spreads for bread. Cream and cheese. Cakes, biscuits and crisps. Small amounts in whole milk and yoghurt, egg yolks and lean meat. There are usually plenty of omega 6 fats in the diet. Oily fish in fish pie or fish cakes are good sources of omega 3 long chain fats, DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid). Rapeseed oil and walnut oil are good sources of omega 3 ALA (alpha-linolenic acid). Most pure vegetable oil in the UK is from rapeseed. Olive and soya have a good balance of omega 3 and omega 6.	No RNI. About 35 – 40% of energy should be taken as fat. Omega 3 and omega 6 fats are essential – the body cannot make them, and they must be part of the diet. 0.2% or more of total energy should come from omega 3 fats. 1% or more of total dietary energy should come from omega 6 fats.	Insufficient energy (kilocalories) from fat (and carbohydrate) causes poor growth and development. Excess fat intake can cause obesity.

Nutrient	Function in the body	Food sources which toddlers enjoy	Daily requirement (RNI) for 1 – 3 year olds	Signs of deficiency or excess in toddlers
Fibre Also called 'non-starch polysaccharides'. Fibre includes: non-digestible carbohydrate, mostly derived from plant material that are fermented in the colon. Prebiotics.	Regular functioning of intestines and bowel. Feeds the bacteria in the colon and maintains colonic health.	Fruits and vegetables, cereals and food made from flours. Wholegrain cereals such as porridge, Ready Brek and Weetabix contain more fibre than most processed cereals. Wholegrain flours and breads will contain more fibre than white flour and breads.	There are no definite recommendations for toddlers in the UK, but about 5 – 7g is an average intake.	Constipation and disordered bowel habit may occur with too little fibre intake.
Fluid	For maintaining normal hydration, blood pressure and fluid balance. Toddlers' bodies are about 70% water.	Milk, fruit juices and diluted squashes are all about 90% water. Soups, sauces and fruit and vegetables have high water contents.	Six to eight drinks per day in addition to fluid in some foods. About 120mls (4oz) is an average drink for 1 – 3 year olds. More may be needed on a very hot day and after a lot of physical activity.	Constipation can be a result of too little fluid intake. This is fairly common in the UK. Dehydration caused by not enough fluid, can cause lethargy.
Vitamin A **(Retinol and Carotene)**	Ensures normal growth and development, strengthens immune systems, healthy skin and good night vision.	Whole cows' milk. Orange, red and dark green fruit and vegetables such as carrots, red peppers, tomatoes, sweet potato, pumpkin, apricots, mangoes, cantaloupe melons, broccoli. Fish pie or fish cakes using oily fish. Liver pate.	400ug/day.	Deficiency causes night blindness, skin problems, and increased infection particularly of the respiratory and gastrointestinal tracts. 40% of toddlers in the UK have insufficient vitamin A in their diets.
B Vitamins Includes thiamine, folic acid, niacin (nicotinamide), riboflavin, pyridoxine, biotin, pantothenic acid and cyanocobalamin.	Growth and development of healthy nervous system. Involved in converting food into energy.	Liver pate and yeast extract such as Marmite and the only food that contain all the B vitamins. Most breakfast cereals are fortified with extra B vitamins. Other good sources are meat, milk, yoghurt, cheese, fish, eggs, seeds, bread and vegetables.	0.5mg/day vitamin B (thiamine). 0.6mg/day vitamin B (riboflavin). 8mg/day vitamin B (niacin). 0.7mg/day vitamin b (pyridoxine). 0.5ug/day vitamin B (cyanocobalamin). 70ug/day folate. Pantothenic acid – no recommendation. Biotin – no recommendation.	Deficiency causes cracked and sore skin in some cases, and anaemia and heart failure. Damage to nerves may result from anaemia due to insufficient vitamin B or folate. Spina bifida can be caused by insufficient folate in early months of pregnancy. B vitamin deficiencies are rarely seen in toddlers in the UK.

Nutrient	Function in the body	Food sources which toddlers enjoy	Daily requirement (RNI) for 1 – 3 year olds	Signs of deficiency or excess in toddlers
Vitamin C (Ascorbic acid)	Helps absorption of iron from non-meat sources. Antioxidant that protects cells from damage. Maintains blood vessels, cartilage, muscle and bone. Strengthens immune function and aids wound healing.	Most fruit and vegetables contain some. The richest sources are blackcurrants, kiwi fruit, citrus fruits, tomatoes, peppers and strawberries. Potato, sweet potatoes and mangoes are also good sources. Some fruit juices and squashes often have added vitamin C.	30mg/day.	Deficiency causes slow wound healing, recurrent infections and bleeding gums. In extremely rare cases vitamin C deficiency can cause scurvy. One in three toddlers in the UK do not have enough vitamin C in the diet.
Vitamin D	Needed to absorb calcium into the body, and to regulate its movement in and out of the skeleton ensuring strong bones.	Most vitamin D is made in the skin when toddlers are outside during the summer months i.e. April – September in the UK. It is the ultraviolet sunlight, which acts on exposed skin to make vitamin D. Fish cakes or pie made with oily fish, margarine and whole milk. Some breakfast cereals have vitamin D added. Follow-on milks and toddler milks are enriched with it.	7ug/day.	Deficiency can cause weakness of the muscles and twitching (tetany), rickets and bone deformities. This is not unusual in the UK especially toddlers of Asian, African and middle-eastern ethnic origins.
Vitamin E	Antioxidant that protects cell structures.	In a wide variety of foods. Rich sources are vegetable oils and margarine, avocados, almonds, meat, fish eggs.	No RNI.	Deficiency very rarely seen in toddlers.
Vitamin K	Blood clotting.	Main produced by bacteria in the large bowel. Rich food sources are green leafy vegetables and broccoli.	No recommendation.	Tendency to bleed can sometimes be due to deficiency.
Minerals				
Calcium	Bone strength and teeth. Cell structure and function.	Richest sources are milk, cheese, yogurt and fortified soya milk. White bread is fortified with calcium. Biscuits or cakes with ground almonds. Canned fish with bones such as sardines.	350mg/day.	Deficiency can cause fits or bone deformity due to rickets.
Copper	Energy and protein production.	In small amounts in most foods.	0.4mg/day.	Deficiency is very rare in the UK. Fragile bones and increased infections can be effects of deficiency.

Nutrient	Function in the body	Food sources which toddlers enjoy	Daily requirement (RNI) for 1 – 3 year olds	Signs of deficiency or excess in toddlers
Fluoride	Strengthens tooth enamel and helps to prevent tooth decay.	Pea sized amount of fluoride toothpaste on toothbrush when cleaning teeth provides enough. Supplied by drinking water in areas where tap water is fluoridated or the water naturally contains adequate levels. Water is not fluoridated in Scotland, Northern Ireland and some areas of England. For information of fluoridated water in England and Wales see: **http:/www.defra.gov.uk/environment/statistics/inlwater/iwfluoride.htm**	Safe intake is 0.12mg?kg body weight/day.	Dental caries are more common with fluoride deficiency. In the UK about 10% of toddlers have dental decay. Dental fluorosis or brown spots on teeth is caused by excess intake of fluoride. This is usually due to giving too much of a fluoride supplement.
Iodine	Part of the hormone thyroxine, which helps convert food into energy and assists general mental and physical development.	Fish cakes and fish pie, milk, yoghurt and eggs.	70ug/day.	An enlarged thyroid gland may indicate deficiency.
Iron	Necessary for carrying oxygen around the body in the blood (haemoglobin) and muscles (myoglobin). Also involved in energy metabolism and the immune system.	Best sources are red meat (beef, lamb and pork) and dark poultry meat e.g. chicken legs and thighs. White meat such as chicken breast has less. Other sources are: • fortified breakfast cereals • ground or chopped nuts (see back page for caution with peanuts and whole nuts*) • dhal, lentils, hummus • poppadums made with lentil flour • bhajis and Bombay mix made with chickpea flour. Smaller amounts are in fruit and vegetables. Follow-on milks and toddler milks are fortified with it.	6.9mg/day.	Iron deficiency causes anaemia, increases susceptibility to infections, lethargy, and delays physical and mental development. In the UK one in eight toddlers is anaemic.
Magnesium	Helps bone development, protein production and converting food into energy.	Best sources are wholegrain breakfast cereals, milk and yoghurt. Also in meat, egg, dhal, lentils, hummus, potatoes and some vegetables.	85mg/day.	Deficiency can cause muscle weakness, poor growth and neuromuscular Function. This is rare in the UK.

Nutrient	Function in the body	Food sources which toddlers enjoy	Daily requirement (RNI) for 1 – 3 year olds	Signs of deficiency or excess in toddlers
Phosphorus	Bone growth and energy metabolism.	Richest source is milk. Present in most other foods.	270mg/day.	Deficiency is rare and only seen in association with other conditions which cause malabsorption.
Potassium	Important for fluid balance, muscle contraction and nerve conduction.	Milk, vegetables and potatoes. Bananas, dried apricots, prunes, dates and kiwi fruit are also good sources.	800mg/day.	A deficiency which causes muscle weakness is rarely seen unless there are kidney problems.
Selenium	Antioxidant.	Meat, fish, vegetables and cereals.	15ug/day.	Heart problems have been linked to selenium deficiency in China but it is rarely seen elsewhere.
Sodium	Important for acid-base regulation, fluid balance and blood pressure.	Salt is the main source so processed foods with added salt such as crisps, bacon, ham, cheese and bread contain the highest amounts. It is also found in meat, milk and yogurt.	500mg/day.	Rare but can cause loss of appetite and mental confusion. Excess salt increases thirst and can cause fits and death. Chronic high sodium intake my cause hypertension.
Zinc	Involved in the function of many enzymes. It has a structural role in growth hormone and insulin.	Best sources are meat, fish and shellfish and eggs. Other good sources are milk, wholegrain breakfast cereals such as porridge, Shredded Wheat, Weetabix and bread. Some in potatoes, dhal, lentils, hummus and leafy vegetables.	5mg/day.	A deficiency can cause wounds to heal slowly. A skin rash is seen in more severe cases of deficiency. Zinc deficiency is common in the UK. It is estimated that 70% of toddlers have insufficient zinc in their diets.
Phytochemicals				
Substances in plants, which provide long-term protection against cancer and heart disease. Also called flavanoids, flavanols, isoflavones. Examples: lycopene lutein and quercertin.	Important antioxidants play a part in immune function.	All fruit and vegetables, especially brightly coloured. Cocoa and chocolate.	No recommendation for individual phytochemicals but for adults, five servings of fruit and vegetables per day will ensure adequate intake. Giving toddlers fruit and/or vegetables at each meal will ensure they get enough.	Unknown in toddlers but adults who do not get enough are at higher risk of heart disease and cancer.

*Peanuts and foods containing them should not be given to children under three years old in families where Parents/carers or siblings suffer with eczema, asthma, food allergies or hay fever. Whole nuts should not be given to children under five years old because of the risk of choking.

Appendix 2

Infant Milk Formulae

Infant Formula	Manufactured by	Use
Nutriprem 1	Cow & Gate	Complete nutrition for preterm and low birthweight infants. Energy and protein levels suitable for catch up growth. Mainly used in hospitals only. Nutriprem 2 and Premcare can be used on discharge and up to 6 months of age, or when a specific weight gain is achieved.
Nutriprem 2	Cow & Gate	
Oster prem	Farleys	
Premcare	Farleys	
Pre-Aptamil	Milupa	
SMA LBW	SMA	
Cow & Gate Premium	Cow & Gate	Whey-based standard Infant Milk formula. Contain similar protein profile to breast milk. Suitable for infants aged 0 – 12 months.
Organic First	Cow & Gate	
Farley's First	Farleys	
SMA Gold	SMA	
Aptamil First	Milupa	
Cow & Gate Plus	Cow & Gate	Casein based standard Infant milk formula. Protein profile similar to cow's milk. Equivalent kilocalorie and protein content to whey-based formulae. Suitable for infants aged 0 – 12 months.
Farley's Second	Farleys	
SMA White	SMA	
Aptamil Extra Hungry	Milupa	
Aptamil Follow-On	Milupa	Follow on milks fortified with iron. Can be used to help improve iron status when the weaning diet is inadequate. Also contain additional protein and Vitamin D. Kilocalorie content equivalent to standard infant milk formulae. Suitable for infants from age 6 months. (* from 9 months).
Cow & Gate Step-up	Cow & Gate	
Cow & Gate Next Steps*	Cow & Gate	
Follow on Organic	Cow & Gate	
Farley's Follow On	Farleys	
SMA Progress	SMA	
Aptamil Growing Up Milk	Milupa	Formulated for infants aged 1 – 3 years. Contain more iron and other vitamins and minerals than cow's milk. Can be used if weaning diet is inadequate.
Cow & Gate Growing Up Milk	Cow & Gate	
Comfort 1	Cow & Gate	Marketed for children with reflux, colic and minor digestive problems. Contains partially hydrolysed whey proteins, lower lactose levels and is pre-thickened. Not suitable for use in cow's milk protein intolerance.
Comfort 2	Cow & Gate	
Aptamil Easy Digest	Milupa	

Infant Formula	Manufactured by	Use
Wysoy	SMA	Soya based formula, can be used in suspected cow's milk intolerance. Not recommended for use in infants less than 6 months of age or as first line management of milk protein or lactose intolerance.
Infasoy	Cow & Gate	
Prosobee	Mead Johnson	
Prejomin	Milupa	
Farleys Soya Formula	Farleys	
SMA LF	SMA	Lactose free formula for use in suspected lactose intolerance. Use until standard formula is tolerated.
Enfamil Lactofree	Mead Johnson	
Enfamil AR	Mead Johnson	Feeds that thicken in the stomach for use in the management of gastro-oesophageal reflux. Suitable from birth to 12 months.
SMA Staydown	SMA	
Nutramigen 1	Mead Johnson	Extensively hydrolysed formula for use in whole protein and/or disaccharide intolerance. Suitable form birth to 2 years. **Nutramigen 2 from 6 months onwards.
Nutramigen 2**	Mead Johnson	
Pepdite	SHS	
Pepti	Cow & Gate	Contains lactose. An extensively hydrolysed formula used for the management of cow's milk protein allergy/intolerance.
Pregestemil	Mead Johnson	Extensively hydrolysed formulae used for the management of whole protein and/or disaccharide intolerance, multiple malabsorption states and short bowel syndrome. Contains medium chain triglycerides.
MCT Pepdite	SHS	
Pepti-junior	Cow & Gate	
Neocate	SHS	Amino acid based formula. Used for the management of whole protein and protein hydrolysate intolerance, multiple malabsorption states and short bowel syndrome. Suitable from birth. *** Neocate advance from 12 months.
Neocate Advance***	SHS	
Neocate Active	SHS	Amino acid based formula, used as a supplement to solid food in infants 1 year and over.
SMA High Energy	SMA	High-energy infant milks in a ready to feed format. For use in faltering growth or for infants who are fluid restricted. Contain higher kilocalorie and protein than standard formula.
Infatrini	Nutricia	

Disclaimer

Central Lancashire PCT actively promotes breastfeeding and the information provided within these guidelines does not endorse any breast milk substitutes or products.

In addition, Central Lancashire PCT Breastfeeding Policy (2008) states:

- The advertising of breast milk substitutes, feeding bottles, teats or dummies by health professionals is not permissible. Breast-milk substitutes will not be sold or promoted on health care premises as part of the "Healthy Start" Initiative (DoH 2005)
- The display of manufacturers' logos of these products on such items as calendars and stationery and other promotion products are also prohibited in accordance with the International Code of Marketing Breast milk Substitutes (World Health Organisation 1981)
- Direct contact between health professionals and formula milk company representatives is not permitted
- Promotional literature provided by the manufacturers of infant formula feeds is not to be given out by health professionals. The only sources of promotional literature on infant feeding to be distributed to women and their families will be those provided by the Department of Health / UNICEF BFI, voluntary breastfeeding groups and others deemed suitable by the Central Lancashire breastfeeding strategy group.

Appendix 3

Paediatric Group Position Statement on Breastfeeding and Weaning on to Solid Foods

Following WHO guidance, the Department of Health issued a statement on breastfeeding (12/05/03):

> *'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.'*

- Breastfeeding is the best form of nutrition for healthy infants and can provide complete nutrition for the first six months (26 weeks) of life for most infants.
- Breastfeeding mothers need appropriate nutritional advice (and supplementation where necessary) to ensure that their breast milk provides good nutrition for their babies (Mughal et al, 1999; Shaw & Pal, 2002; Savoie & Rioux, 2002). Despite these measures, some infants may experience a faltering in their growth or show evidence of nutritional deficiencies when exclusively breastfed for six months (Butte et al, 2002; Lanigan et al, 2001). Therefore, individual circumstances need to be considered when professionals are giving advice on the introduction of solid foods.
- There are nutritional and developmental reasons why infants need solid foods from six months (DoH, 1994). Infants who are weaned at or near six months after a shortened period on smooth pureed foods will need to be moved onto the second stage of weaning (DoH, 1994) more quickly than those weaned earlier to ensure continued development of normal feeding behaviour (Northstone et al, 2001) and continued nutritional adequacy. (Second Stage of weaning: beginning mashed food with soft lumps and soft finger foods between the ages of six and nine months). Foods high in iron including meat, oily fish and pulses, should be introduced at or around six months.
- The DoH have now clarified that six months (26 weeks) is the recommended age for introduction of solid food for all infants,for both formula fed and breastfed infants (DoH, 2004).
- Many parents will wish to wean earlier than six months (Hamlyn et al, 2002; Fewtrell et al, 2003; Foote & Marriott, 2003). Should they wish to do this, four months or 17 weeks should be regarded as the earliest age at which solids should be introduced (DoH, 1994). In spite of this guideline issued 10 years ago, 41% of mothers wean their babies onto solids before 16 weeks (Hamlyn et al, 2002).
- Further research is needed into the best age at which solid foods should be introduced – and into whether there are different needs for breast and bottle fed babies, as their oral experiences are very different.
- Preterm infants are a special case and advice should be sought from the dietitian and medical team who are caring for them. More information is available on weaning preterm infants from BLISS 'The Premature baby charity': www.BLISS.org.uk
- Whatever feeding decisions parents make (breastfeeding or formula feeding; early or later weaning) they need to be supported and given appropriate advice to ensure that all infants are fed safely and are having a nutritionally adequate diet.

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December 04

Summary of Recommendations for Weaning

Fluid	Before 6 Months	6 Months (17 – 26 weeks)	6 – 9 Months (26 weeks)	9 – 12 Months	12 Months
Exclusive Breast Feeding	No solids before 6 months if introduced not before 17 weeks. WHO 2001 DoH 2003	Continue breast feeding. Start solids.	500 – 600mls. Breast/Formula milk. Offer Solids.	500 – 600mls. Breast Formula milk Cooled boiled water Offer solids. (Breast feeds will gradually decrease as solid intake increases).	Minimum 350mls milk daily - Breast - Formula/ - Whole cow's milk. or 2 servings of dairy products (eg. Yoghurt, cheese, cheese sauce). Discourage large volumes of milk (No more than 600mls/day) - Offer water to drink. Unsweetened fruit juice may be offered with meals (not as main drink).
Formula Fed	No solids before 6 months if introduced not before 17 weeks. WHO 2001 DoH 2003 May need small amount of additional cooled boiled water. DoH 2004	Formula milk. Cooled boiled water. Start solids.	500 – 600mls Formula milk. Cooled boiled water.	Formula milk. Cooled boiled water.	
Breastfed + Formula Fed	No solids before 6 months if introduced not before 17 weeks. WHO 2001 DoH 2003 May need small amount of additional cooled boiled water. DoH 2004	Breast milk/Formula. Cooled boiled water. Start solids.	500 – 600mls Breast milk/Formula milk. Cooled boiled water.	Breast milk/Formula. Cooled boiled water.	
Starchy Foods	Recommend wait until 6 months. Smooth cereals e.g. rice based, potatoes.	Smooth cereals e.g. rice based, potatoes. 1 – 2 Servings per day.	Start to introduce more cereals including wholemeal bread, 'lumpier texture' 'finger foods' e.g. Toast. 2 – 3 Servings per day.	Starchy foods of normal adult texture. 3 – 4 Servings per day.	Starchy foods of normal adult texture. Discourage high fat foods savoury snacks and pastry. 1 serving at each meal.
Veg + Fruit	Recommend wait until 6 months. Soft-cooked vegetables and fruitas a smooth puree.	Soft-cooked vegetables and fruit as a smooth puree. 1 – 2 Servings per day.	Raw soft fruit & vegetables (as finger foods). Cooked fruit + vegetables can be a coarser/mashed texture. 2 Servings per day.	Lightly cooked or raw foods. Chopped finger foods. Vitamin C containing foods e.g. unsweetened orange juice if diet is meat free. 3 – 4 Servings per day.	Adult texture for fruit and vegetables. 5 tastes (child size portions) per day.
Meat + Meat Alternatives e.g. fish, pulse, eggs	Recommend wait until 6 months. Use soft cooked meat and pulses as a puree.	Use soft cooked meat and pulses as a puree. At least 1 Serving per day.	Soft cooked minced or puree meat/fish/pulses Hard boiled egg can be used as a finger food. 1 Serving per day.	Minced/chopped cooked meats/fish/pulses. Minimum 1 servings per day from animal source or 2 from vegetable sources.	Encourage lean meat and oily fish. Minimum 1 servings per day from animal source or 2 from vegetable sources.
Other Advice	• Recommend wait until 6 months. • Encourage savoury foods rather than sweet ones. • No Gluten containing foods.	• Encourage savoury foods rather than sweet ones. • Introduce cup or beaker.	• Can have Gluten containing foods. • Introduce cup or beaker.	Limit salty foods.	Limit crisps and savoury snacks. Do not add sugar to drinks. Encourage three meals a day. Discourage snacking on foods high in fat, salt and sugar.

Adapted from Weaning and the Weaning Diet (DOH 1994)

Appendix 4

Eatwell Plate

The eatwell plate

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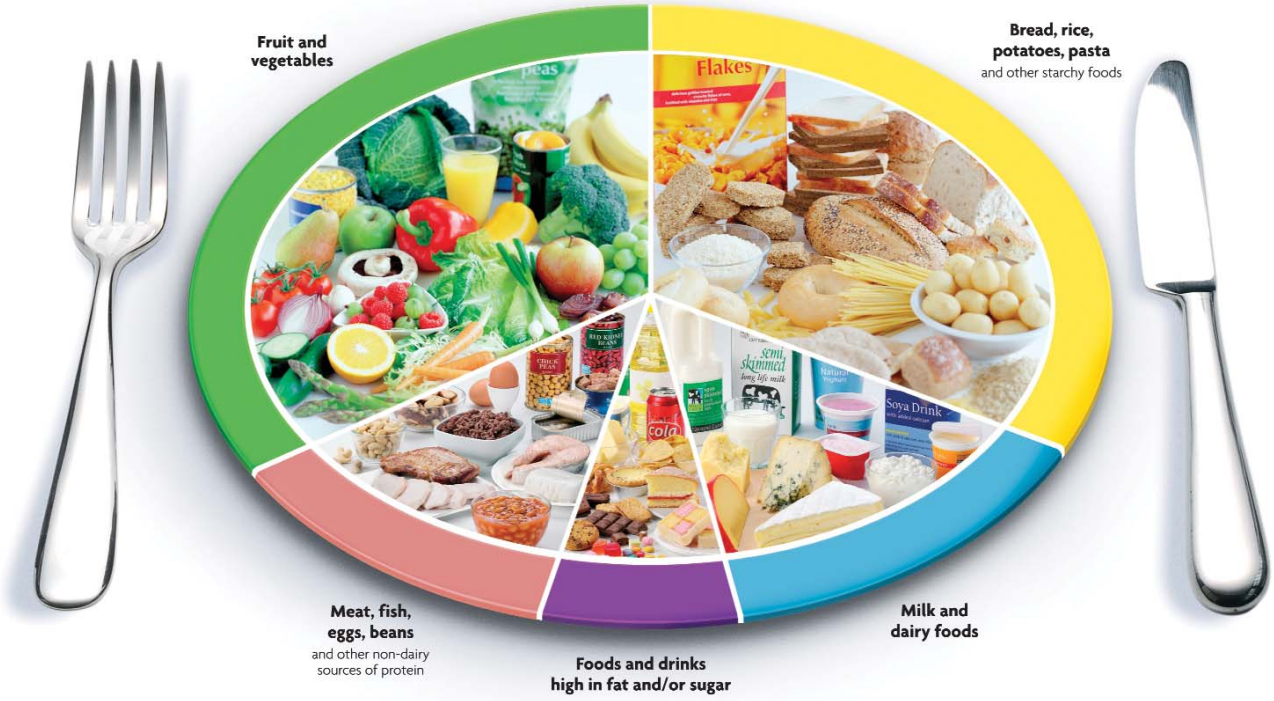
Use the eatwell plate to help you get the balance right. It shows how much of what you eat should come from each food group.



Appendix 5

Bristol Stool Chart

Type 1		Separate hard lumps, like nuts (hard to pass).
Type 2		Sausage shaped but lumpy.
Type 3		Like a sausage but with cracks on its surface.
Type 4		Like a sausage or snake, smooth and soft.
Type 5		Soft blobs with clear-cut edges (passed easily).
Type 6		Fluffy pieces with ragged edges, a mushy stool.
Type 7		Watery, no solid pieces. **Entirely Liquid.**