

Managing weaning problems and complementary feeding

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Abstract

This review article aims to pull together the latest research and guidelines regarding weaning infants from breast or bottlefeeding onto solid foods. It summarizes the guidelines from the World Health Organisation, Department of Health and the British Dietetic Association. It also attempts to capture the changes to guidelines as the understanding of an infants development has changed. Guidelines tend to apply to normally developing children and do not take into account aspects such as developmental delay, physical conditions, environmental factors and syndromes effecting feeding. The aim of the article is to raise the level of awareness of these factors in health professionals so that they can help contain parental anxiety and expectations of their infant's feeding. The article explores the research on when to wean, what to wean with, along with factors that influence the disruption of stages.

Keywords anxiety; baby led weaning; complementary feeding; development; expectations; weaning

Definition of weaning

By weaning we mean the transitional process from exclusive milk feeding (breast or formula) to the consumption of family foods. This may also be termed complementary feeding (CF). This is an area characterized by strongly held beliefs, and guaranteed to inspire heated debate amongst parents and health professionals alike. The timing, the type and quantity of foods offered and the extent to which an infant should be in control of their own intake are all hot topics currently. What follows is an attempt to sort the recommendations from the reality and to suggest some amendments to the guidelines based on available evidence and clinical practice.

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When to wean?

Recommendations

Until 2003, recommendations in the UK were to introduce solid foods between 4 and 6 months of age. However, in 2001, the World Health Organisation had issued a revised recommendation that mothers should breastfeed exclusively for approximately 6 months (WHO, 2001) and the Department of Health (DH) guidelines were amended accordingly in 2003. The rationale provided for this was that a baby's gut does not mature until around 6 months and that introducing complementary foods before this increases the risk of infections and allergies (DH 'Birth to Five'). Where parents are considering starting the process earlier than 6 months, the DH advises consultation with a health professional. The British Dietetic Association (BDA) takes a less prescriptive stand, suggesting an 'individual' weaning age dictated by a child's specific developmental stage (BDA, 2011). Both the Department of Health and the BDA have provided guidelines on the signs to indicate a child's readiness to eat solid foods. Despite the known implications for long-term health of early nutrition, the evidence base for changing the recommendations in 2003 was subjected to very little investigation and even the Department of Health's own Scientific Advisory Committee on Nutrition were not asked to formally comment.

The reality

In the UK, 30% of mothers had introduced solids by 4 months, 75% by 5 months and 94% by 6 months according to the 2010 Infant Feeding Survey (DH, 2013). Only roughly 5% waited until after 6 months to begin complementary feeding. Earlier weaning was associated with age and social class, such that younger mothers and those from more deprived backgrounds were more likely to wean early, as were mothers who returned to work when their baby was between 4 and 6 months of age. Ethnicity was also a factor predicting weaning age. Mothers from Asian, Black, Chinese and other ethnic backgrounds tended to introduce solid foods later than their white counterparts, with Asian and Chinese mothers the least likely to have begun weaning before 4 months.

The best evidence

The WHO recommendation to breastfeed exclusively for 6 months was principally based on a systematic review undertaken by Kramer and Kakuma (subsequently published in 2003), the aim of which was to compare mother and child outcomes of exclusive breastfeeding for 6 months vs 4 months or less. Only two studies were randomized controlled trials and both of these were conducted in Honduras (a developing country) where all studies of developed countries were observational. Conclusions were that exclusive breastfeeding for 6 months was advantageous in some respects (reducing infection rate), but also potentially risky (iron deficiency with associated risks of long-term adverse effects on development). A review published simultaneously of the evidence concerning the timing of weaning, concluded that there was insufficient evidence to justify a change from the existing recommendations of 4–6 months. In the developing world where clean water and food are scarce, exclusive breastfeeding for 6 months made sense as a recommendation, but in developed countries evidence is mounting that the costs may outweigh the benefits.

For example, an emerging literature base suggests that earlier introduction to solids may actually reduce the risks of allergic

sensitization to foods, inhalant allergens and celiac disease and that a window of opportunity exists between the 17th and 27th week of life in which to introduce all foods and that after this point, the risk of atopic diseases actually increases. The idea that all infants mature and become ready to begin the transition to an adult diet at the same time despite differing gestational age at birth, height and weight etc, seem implausible and some researchers have proposed that babies should be “managed according to their individual needs”. In support, a recent review of evidence from developed countries by the EFSA Panel of Dietetic Products, Nutrition & Allergies concluded that the “...introduction of complementary food into the diet of healthy term infants in the EU between 4 and 6 months is safe and does not pose a risk for adverse health effects...” and that some infants may indeed *need* additional sources of nutrients to support growth and development.

Case study 1

Oliver was born full term, but had difficulties breastfeeding. His Mother had terrible feelings of guilt as she had desperately wanted to breastfeed. She reported feeling unsupported by health professionals and judged by her inability to breastfeed. Their advice was to give Oliver a bottle which she did. This guilt continued and when Oliver was difficult to wean, her feelings of anxiety and guilt increased. Oliver was a bright child who in all areas was developing well and meeting all of his milestones. However his mother continually compared him to other infants in her NCT group and appeared unable to see how well Oliver was doing and how he was thriving. She had a very supportive husband and parents-in-law. Oliver and his parents were referred to the Feeding Disorder Service at GOSH where they were seen by a Specialist Feeding Disorder Practitioner. She reassured them that Oliver was doing well and highlighted the fact that he was thriving. She offered regular telephone support to help the parents manage their anxieties. Eventually Oliver's mother was able to manage her feelings of guilt and contain the constant comparisons she made with other children. This allowed her to acknowledge the progress that Oliver was making albeit at his own pace.

Problems with weaning

The Infant Feeding Survey found that 11% of UK mothers of 1-year-olds reported having experienced difficulties in weaning their child. Breaking this figure down by age at weaning, the survey revealed that 17% of mothers who had introduced solids to their infant between 5 and 6 months or later stated that they had experienced difficulties compared with only 7% of those who had introduced solids between 3 and 4 months. Four per cent described their child as having ‘fussy eating habits’.

Recommendations for weaning do not take into account any significant difficulties in the temperament, family context for the infant or their health. Conditions that can impact on the development of feeding in an infant include symptoms of gastroesophageal reflux (GR), food allergies, cleft lip and palate, syndromes such as Down's, Noonan's are just some of the

conditions that are known to have an impact on feeding development. Symptoms associated with severe reflux can also disrupt the relationship a baby develops with food and the memory of milk becoming the ‘enemy’ may be carried over into the weaning process creating significant difficulties for the infant. If the reflux has been caused by underlying pathology then a restricted diet may be introduced. It is common for the early signs of GR to be missed.

Other factors that can impact on the weaning process are sensory issues and developmental delay, along with the sensory issues specifically associated with autistic spectrum disorders. Heightened senses including smell, touch and taste can result in negative experiences with certain foods, generating significant anxiety and sometimes leading to the development of aversions to foods or to textures, especially mixed textures such as lumps in puree. It is often at this stage in the weaning process that disruptions occur. There is an assumption that infants progress from milk, to smooth puree to lumpy puree, then to solids and finger foods. However there is growing evidence that some infants miss out the lumpy puree stage and adapt better to finger foods.

The child's temperament is also important to consider, as are any mental health difficulties in parents or postnatal depression in the main care giver. These can have a significant impact on the weaning process, and are important for health professionals to consider and be aware of.

If not contained, the parental anxiety that can ensue from feeding difficulties can lead to exaggerated feelings of failure and rejection which in turn significantly impact on the tension at meal times. As a result, the child may accept even less food and this can lead to concerns from professionals regarding failure to thrive. When discussed with parents, this can increase parental anxiety and may leave the family trapped in a cycle of anxiety, withdrawal from meal times, extra pressure being exerted, high tensions, shouting and force-feeding.

Case study 2

Padraig S was born full term, he breastfed well. His mother described him as feeding all day and night (which she loved). Weaning was introduced at 6 months as per the guidance in the baby books; Mrs S reported that Padraig refused several meals a day. She asked for a referral to the Feeding Disorders Clinic. At assessment when asked what the refusal looked like she described Padraig as turning his head away and covering his mouth. When this was explored further she reported that she would feed Padraig every four hours, even after weaning. As part of the assessment Padraig was observed feeding. After Padraig had eaten adequate amounts he did indeed turn his head and cover his mouth. However, this was an appropriate response in a baby who had eaten enough food. Following a discussion with Padraig's parents it transpired that as a small child Mrs S had a history of being underfed by a carer, this led to Mrs S being treated for malnutrition and left her with a distorted view on feeding her own infant. With support and encouragement Mrs S was able to read Padraig's cues more easily and respond appropriately without feeling guilty.

What foods to offer?

Recommendations

Recommendations from the DoH and the BDA are that first foods be simple and easily digested such as rice, fruit or vegetables, simply pureed with no added salt or sugar or mixed with breast or formula milk.

The reality

By far the most common first food offered to infants is baby rice (57% in the Infant Feeding Survey) although there is some variation according to the time of introduction (62% between 4 and 6 months, 43% before 4 months and 44% after 6 months). Only 8% offered fruit as first food and 7% offered vegetables despite recommendations.

Food type	%
Baby rice	57
Ready-made baby food	12
Home-made foods	11
Rusk	10
Fruit	8
Vegetables	7
Any other food	6

The best evidence

Early exposure to a wide variety of foods and flavours has been shown to be predictive of later dietary intake. The acceptance of novel flavours is enhanced in younger infants and earlier introduction of fruit and vegetables during complementary feeding has been associated with greater intake in later childhood. There is some evidence of a critical period for flavour acceptance between 4 and 7 months, when infants are particularly receptive to new tastes. It is important to capitalize on this window of opportunity by introducing a wide variety of fruit and vegetables during the period of complementary feeding. As complementary feeding progresses it is also important for infants to move on from smooth purées to lumpier foods and varied textures. Research suggests in addition to experiencing a variety of flavours during complementary feeding, exposure to a variety of textures assists with the transition to an adult diet. Exposure to lumpier foods between the ages of 6 and 9 months has been associated with reduced feeding problems and greater fruit and vegetable consumption in later childhood. As noted earlier some children cannot tolerate the lumpier food textures and prefer to move from smooth purees to finger foods.

Children generally prefer fruits to vegetables, reflecting human's innate preference for sweet tastes and dislike of sour or bitter tastes, but some studies have shown that before 7 months, infants will consume more of an unfamiliar bitter taste. It may therefore, be beneficial for parents to offer vegetables before fruits during complementary feeding to capitalize on this.

Children also learn food preferences through experience. In a series of studies looking at preschool children's food preferences, Leann Birch and colleagues in the USA found the two major determinants of liking were sweetness and familiarity. The simplest way to increase children's preferences for new foods is to increase their familiarity by repeatedly offering small

quantities of the food to taste, and this has been shown to increase both liking and intake. Research has shown that while initial rejection of a novel vegetable is not uncommon in 6–10-month old infants, 70% will eat it after eight tastings. Unfortunately, mothers typically offer an initially rejected vegetable to their infant less than five times before giving up. Parents generally judge their infants liking by their facial expression while eating, but infants' facial responses to foods may not accurately indicate their willingness to continue eating. If parents focus on the infant's willingness to eat rather than their facial expression, and persistently offer small tastes of a vegetable on multiple occasions, both liking and intake may be increased, even for initially rejected foods.

Whilst this 'repeated exposure' to a single vegetable flavour increases acceptance, a lack of variety risks "sensory specific satiety" – literally boredom with the taste. A study of infants during the period of complementary feeding, found that those who were offered a variety of different vegetables over 9 days ate more of a novel food than those fed only potatoes or carrots. There is also evidence to suggest that daily changes in the vegetables offered to infants leads to immediate increases in preference and intake and decreases in rejection of unfamiliar tastes. It is often assumed that infants should only be given the blandest of foods to taste (e.g. rice or potatoes) but there is no reason to avoid the more bitter tasting green vegetables during complementary feeding. Evidence suggests the maximum benefits on food acceptance are achieved by exposing infants to vegetables with a range of sensory properties, i.e. lots of different colours, tastes and textures, during complementary feeding.

Case study 3

John was referred to the Feeding Disorder Clinic at 18 months of age. His problem was described as not chewing. Local professionals thought that he should be chewing by now and that his mother should be giving him mixed textures. He was having pureed foods and smooth yoghurts and milk from a bottle. At the first appointment the 'goal-based outcome' sheet from parents scored his chewing ability at 0 (on a scale of 0–10). Recommendations from the Specialist Feeding Disorder Practitioner was that parents should not push mixed textures, that it was likely that he will make changes slowly on his terms. She suggested offering finger foods and would review in 3 months. Six months post first appointment she met with the child and family again. John had recently been diagnosed with an Autistic Spectrum Disorder. This put into context the idea that John disliked change and presented as quite rigid with his eating pattern. Parents were still coming to terms with the diagnosis. However he was now chewing finger foods. John remained on soft main meals; he was having a well balance diet and was growing well. The parents goal-based outcome for chewing had gone from 0 to 10.

How to offer first foods?

Recommendations

Department of Health recommendations are for purees, cereals and mashed foods as first foods, but also suggest the offering of

soft finger foods that an infant can pick up. Of course, these recommendations assume that infants are at least 6 months old when weaning commences. Finger foods are less appropriate for a younger baby who may be unable to co-ordinate the hand to mouth process required.

The reality

Increasing numbers of mothers are opting to try 'baby-led weaning' (BLW) an approach that advocates the provision of whole family foods for self-feeding, rather than purees that are spoon-fed. Thus, this method is not entirely dissimilar to the DoH guidelines with regard to suitable foods and the concept of developmental readiness at 6 months, but differs in terms of textures and, perhaps, variety offered.

The best evidence

There is no doubt as to the importance of introducing texture to an infant's diet as soon as possible after 6 months. Studies have shown that pickiness is reduced and dietary variety increased when children experience lumpy textures relatively early on. This is wholly compatible with a baby-led approach. With its inherent principles of encouraging self-regulation by the child and responsive feeding by the parent, BLW would appear to be a promising alternative to traditional approaches. In addition, eating the same food together as a family which, is an important component of baby-led weaning is associated with multiple benefits in both health and psychological domains for children of all ages. However, there are some important limitations of the BLW method which should be considered. In one study, mothers using BLW estimated that their infants consumed less solid food and more milk feeds than those following a traditional method and this may result in inadequate nutrient intake for babies older than 6 months of age.

As yet, very little evaluation of the baby-led approach has been forthcoming and as a result, the short- and long-term effects are uncertain. Longitudinal studies are needed to document the impact of this method on diet, weight and eating behaviour and appetite. What is known is that mothers adopting the baby-led weaning method are more likely to be highly educated, have a high status occupation, have breastfed their infant and be married, than those taking a more traditional approach. One thing is certain – the coordination and oral-motor skills required for self-feeding whole foods are rarely present before 6 months in normally developing infants (and may appear much later in those who are developmentally delayed) and therefore if it is established that an earlier weaning age is optimal for long term health, BLW will not be suitable for the majority of infants.

Practice recommendations

Babies and infants develop at different rates and this applies to their development with feeding and eating. First time mothers are more likely to rely on health professionals' advice, so it is very important to be able to contain the worries or anxieties from a parent about how their baby is developing with eating when compared to others. Parents often find it difficult to avoid making comparisons. Be aware that there are some professionals who may be following the guidelines rigidly without considering the

contextual factors for the infant and family. Expectations from professionals regarding developmental level can increase parental anxiety. Advice to 'starve them – they will eventually eat' has in the past been commonly given to parents by health professionals. While this may be true for some children, not all will respond to such tactics and this can actually create further difficulties in a sensitive child.

Mealtime management is very important in optimizing positive development in eating. Correct seating, should be appropriate and supportive. Bringing the infant close to the table and sitting close to them is beneficial. Allow them to explore the food so that they can see, touch and smell the food, regardless of the resulting mess. It is vital that an infant explores food for themselves. Giving an extra spoon allows them to begin to learn to self-feed well before they are capable of managing this completely. Parents should be advised to give small portions and to try to read and respond appropriately to the non-verbal cues a baby gives to signal fullness or dislike of a food's taste, smell or appearance – for example turning their head away or clamping their mouth shut.

Feeding difficulties are frequently reported by the parents, but it is important to observe feeding in order to be able to offer advice and to get an accurate picture of what happens at meal times. ◆

FURTHER READING

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Practice points

- Understand the developmental stage of the infant especially in premature babies or infants with developmental delay
 - Consider parental mental health especially any postnatal depression, help contextualize the difficulties and sign post parents to the appropriate services, alerting GP if necessary
 - Gently explore parents beliefs about feeding and their own relationship with food, consider any history of eating disorders. Research has indicated that it may be difficult for a parent with a history of eating disorders to feed their baby
- Build confidence and give reassurance to the parents
 - Hold in mind individual differences in the infant and in environmental and cultural backgrounds. There is no point insisting on a particular routine if this goes against the parents own beliefs or ways of doing things
 - Mealtime management is important – consider seating, utensils, plates and the infant's ability to see the food and explore it with their hands. Some parents can find it difficult to tolerate mess and it is essential to consider this as, it is a crucial part of an infant's relationship with food
 - Make meal times fun, a time for an infant to explore the food and develop a healthy relationship with eating