

ROUND TABLE

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The Settled Baby

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Nursing
IN PRACTICE

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Sharon Charles
Health Visitor Team
Leader, Kensington
and Chelsea



Anne Childs
Midwife, Queen
Charlotte's and
Chelsea Hospital



Patricia Dyter
Senior Midwife,
Lewisham and
Greenwich NHS Trust



Aba Gaisie
Health Visitor, Hillingdon
Health Visiting Services



Janine Long
Health Visitor,
Waltham Forest



Catherine Masterson
Midwife, Queen
Charlotte's and
Chelsea Hospital



Jackie Morrison
Independent
Health Visitor



Janet Preece
Health Visitor,
Camden



Bunmi Shoyinka
Health Visitor, Barking
and Dagenham
Children's Services



Theresa Saklatvala
Chair, Content Director,
Cogora

Health visitors and midwives met recently to reflect on how responsive feeding can contribute to a more settled baby, to share practical aspects of dealing with and advising on the management of an unsettled baby and to gain an understanding of how a lower-protein formula with prebiotics can contribute to a more settled baby.

The Settled Baby

An unsettled baby has the ability to turn a household upside down, raising stress, anxiety and guilt levels of parents and negatively impacting on the quality of life of all who live there, not least the baby.

Responsive feeding could perhaps contribute to a more settled baby, and a more settled family life. But what does responsive feeding entail?

How might responsive feeding contribute to a more settled baby?

Responsive feeding

It may help to consider what responsive feeding is not. It is not necessarily feeding the baby (breast-fed or formula fed) every time they cry – perhaps the infant is crying for comfort, in which case the breast-fed baby will be more easily calmed by contact with the breast. It is not clock watching – there are too many apps that monitor the

time mum spends breastfeeding and this could create unnecessary anxiety. It is not focusing on emptying the bottle – a formula fed baby does not have to finish the bottle to be satiated.

While there appears to be a greater focus among healthcare professionals on responsive feeding for the breastfed infant, the fundamental importance of understanding your baby's cues of hunger and fullness are equally important for both the breast- and bottle-fed infant. The two-way nature of the carer–infant relationship is paramount to the contribution of responsive feeding in the creation of a settled baby.

Mother and infant have to work together in building this relationship, starting in the womb, with mothers encouraged to stroke the belly and talk to her baby.



'get to know your baby and understand your baby's cues – you are both getting to know one another'

What are the infant cues of hunger and fullness and how might they be overridden?

Crying has to be thought of as the last of the cues for feeding, in both breastfed



and formula fed infants. The earliest cues will be visible agitation – the point at which the mother should go to the baby. She should look to see if the baby is biting their fingers or licking their lips. This is the point at which the cues for responsive feeding are ideally first picked up.

If a feed is offered at the earliest cues and crying persists, the mother is advised to look for other sources of discomfort, for example, the need for a nappy change or simply the need for a cuddle.

As important as the cues to feed, are the cues to stop feeding, and these include the baby stopping sucking, pulling away from the breast or the bottle, turning their

face away, becoming distracted by their surroundings or simply falling asleep.

If cues are not observed and the mother neither recognises nor responds, there is the potential to overfeed, a situation of which many parents may be unaware.

Responsive feeding is an act of reciprocation – the baby giving early cues to which the mother responds appropriately, the culmination of a process of the baby and mother getting to know each other and the start to the infant's own appetite regulation.

Advice offered by the midwife or health visitor aims to help the breastfeeding

mother understand that her baby may well need to feed hourly (because of the tiny stomach and because her milk will be easily and therefore quickly digested) and the formula-feeding mother learning that cues may not be picked up by well-meaning relatives who offer to feed (the Baby Friendly Initiative states that you should have no more than two people who feed the baby).

Who is in control?

The baby leads, but control is shared between the baby and the mother. It is a two-way partnership: the baby leads with the cues of hunger or of fullness, to which the mother responds.

‘if infant formula companies are reducing protein, we have a duty of care to let parents know’

For the sleep-deprived mother whose expectations of the new baby may have been rose-tinted, for the older mother whose professional world has hitherto been one in which she has control or for the mother bombarded with advice from relatives, well-meaning friends and social media, establishing this relationship may be easier said than done.

It is the healthcare professional who bears the professional responsibility of offering guidance and information in equal measure with support and encouragement, in helping achieve the best possible infant–mother feeding relationship, be it breast or formula.



What information does the midwife or health visitor currently give to the mother regarding the benefits of responsive feeding?

- **Impact on the unsettled baby**
A relationship in which the baby is fed in response to cues will be less stressful for both baby and mother, and in turn less stressful for the household, contributing to a more settled baby
- **Impact on rapid weight gain**
If hunger and fullness cues are ignored, it is possible to override a baby’s natural ability to regulate their appetite. Cues are not as closely observed in formula-fed babies and there is the tendency for their feeding to be more regimented, i.e. not necessarily when they are hungry. If breastfeeding is done responsively, the healthy baby will ingest the right amount of breastmilk and weight gain will be at the appropriate rate. Rapid and excessive weight gain should be avoided in feeding healthy term infants. For those infants who are not breastfed, responsively feeding a lower-protein formula may help ensure a healthy growth rate for formula-fed infants.

Key points

- **Responsive feeding promotes healthy weight gain and a settled baby.**
- **The most successful infant-feeding parents are those that are governed neither by the clock nor by the gradations on the side of the bottle.**
- **Midwives and health visitors see themselves as bearing a professional responsibility to encourage and support responsive feeding in both breast and formula-feeding situations.**

What is a settled baby?

Some babies just seem to be more settled than others. A settled baby is one who cries less, who is more interested in their surroundings and who communicates less stress to the mother (and vice versa). Parents may think that a baby is

‘you do not have to have an empty bottle to have a contented baby’



unsettled when they are not unsettled at all, for instance, if they do not fall asleep instantly after a feed. Indeed, responsively fed breast-fed babies may well be awake and alert from the age of two months after a feed, and interested in their surroundings.

A settled breast-fed baby from whom cues of satiety are read may be alert and contented. A settled formula-fed baby, who has not been forced to finish their bottle and who has not been forced to feed at designated times, may likewise be awake and alert. Formula-fed babies may be more likely to be unsettled. One of the reasons for this is that feeding

‘as professionals, we have a duty of care to educate’

cues are less likely to be picked up. In such cases, a settled formula-fed baby will be one who falls asleep in a daze after a feed. A settled baby may be incorrectly synonymous with a sleeping baby. Conversely, a baby left to cry will eventually stop – this is not a sign of contentment, but rather of neglect.

Of all the reasons for an infant crying, mild gastrointestinal (GI) disorders are the most common, manifesting themselves as wind, regurgitation, constipation, sleep disturbance, vomiting, colic or diarrhoea. In these cases, the baby cries not from hunger but from discomfort.

What to do?

Crying from this source of discomfort is more common in formula-fed infants and current advice is to consider the formula constituents (interestingly, modern health



visitor training can encourage a disregard for formula constituents). In any case, experienced midwives and health visitors will know from experience that some formula feeds relieve GI distress.

Breast milk contains prebiotics (oligosaccharides) that stimulate the growth of ‘friendly’ or ‘good’ bacteria (bifidobacteria) in the colons of breastfed infants, which in turn promote softer stools. Formula that has been supplemented with prebiotics has been observed by midwives and health visitors to contribute to a more settled baby.

Key points

- **Settled is not synonymous with either a full tummy or a baby who sleeps for a long period of time after a feed.**
- **Responsive feeding contributes to a settled baby.**
- **Formula feed supplemented with prebiotics has been observed by midwives and health visitors to imitate breast milk in its encouragement of softer stools and more settled babies.**

Why does infant nutrition matter?
In addition to the life-enhancing benefits of a more settled baby, there are far-

‘the most successful breastfeeding mums are the ones who do not clock-watch’

reaching implications of infant nutrition. In the first 1000 days of a baby’s life, programming is in play.

Programming in feeding behaviour

How a baby is fed in the earliest days has the capacity to influence feeding choice, quantity and frequency in later years. But what is as important is not just how babies learn to eat, but what they eat.

Programming by nutrient content

Attitude towards nutrition education of healthcare professionals and parents has come a long way, and companies are increasingly forthcoming on transparency of formula nutrients. And so they should be. Parents – especially new parents – trust companies that make formula and these companies have a moral responsibility to reciprocate.

Nutrition, in the early days, has been shown to impact brain development, appetite regulation and rate of weight gain. Formula-fed babies may be heavier than breastfed babies and put on weight

at a faster rate. The mechanism behind the slower growth patterns observed in breastfed infants is unclear. Possible explanations include behavioural, social and hormonal factors, as well as differences in the composition of breast- and formula milk.

It is the responsibility of the health visitor to recognise the difference between healthy weight gain and unhealthy weight gain and to communicate the difference to the mother. The fixation of baby clinics and of mothers is on weight gain – the health visitor needs to impart to the mother that the health of the baby is not synonymous with rapid weight gain. Sometimes just describing the actual size of the baby’s stomach to the mother will suffice to add a touch of realism to her approach to feeding quantity. Health visitors have a duty of care to alert the mother if a formula-fed baby is putting on weight at too fast a rate, impressing on them the fact that excessive weight gain can continue beyond infancy and on into adulthood – in the UK, 10% of four and five year olds are obese. The long-term implications on obesity, cardiovascular

‘be responsive to your baby in the antenatal period’

Further reading

Iacono G, et al. Gastrointestinal symptoms in infancy: a population-based prospective study. Dig Liver Dis. 2005;37(6):432–8

A population-based prospective study with the aim to ascertain the frequency of the most common GI symptoms in infants during the first six months after birth and to evaluate the influence of some variables on the onset of the symptoms. Regurgitation was found to be the most common disturbance, followed by colic, constipation, failure to thrive, vomiting and diarrhoea. These symptoms led to the prescription of a 'dietary' milk formula in approximately 60% of the cases.

Infante Pina D, et al. Prevalence and dietetic management of mild gastrointestinal disorders in milk-fed infants. World J Gastroenterol. 2008;14(2):248–54

Two sub-studies combined with the aim to assess the prevalence of mild gastrointestinal disorders in milk-fed infants in paediatric practice, and to evaluate the effectiveness and satisfaction with dietetic treatment. The effectiveness of a range of formulas specifically developed for mild GI disorders was assessed, including:

- Anti-colic (low lactose, adapted formula)
- Anti-regurgitation (thickened with starch and enriched amylopectins)
- Anti-diarrhoea (lactose-free and with adapted concentration of electrolytes)
- Anti-constipation (adapted concentration of magnesium and lactose)

This study concluded that mild GI disorders show a high prevalence in paediatric practice and that the adapted milk formulas have been shown to be effective in managing mild GI disorders.

Gale C, et al. Effect of breastfeeding compared with formula feeding on infant body composition: a systematic review and meta-analysis. Am J Clin Nutr. 2012;95(3):656–69

A systematic review and meta-analysis of longitudinal and cross-sectional studies that were performed in infancy and examined body composition in vivo in relation to breastfeeding and formula feeding. Growth patterns differ between breastfed and formula-fed infants, and by 12 months of age, formula-fed infants weigh, on average, 400–600g more than breastfed infants, with significantly higher fat-free mass than breastfed infants.

Baird J, et al. Being big or growing fast: systematic review of size and growth in infancy and later obesity. BMJ. 2005;331(7522):929–36

A systematic review of 24 studies found that larger size or a rapid phase of growth at a range of intervals during the first and second year of life predisposed the infant to later obesity. The consistency of the associations observed between both infant size/growth and later obesity across a range of settings and time periods suggest that the association is robust even with limitations of varied definitions of outcome. This paper concluded that infants who are at the highest end of the distribution for weight or body mass index or who grow rapidly during infancy are at increased risk of subsequent obesity.

Singhal A & Lucas A. Early origins of cardiovascular disease: is there a unifying hypothesis? Lancet 2004;363(9421):1642–5

Singhal and Lucas propose that an adverse long-term effect of faster growth is the common denominator for programming cardiovascular disease and suggest that this notion should be termed the 'growth acceleration hypothesis'. The effect of early growth and nutrition on later cardiovascular health is substantial. The 3 mmHg reduction in diastolic blood pressure observed in infants fed a lower-nutrient (versus nutrient-enriched) diet is greater than all other non-pharmacological means of reducing blood pressure, including weight loss, salt restriction and exercise. Lowering population-wide diastolic blood pressure by only 2 mmHg was estimated to reduce prevalence of hypertension by 17%, coronary heart disease by 6% and stroke/transient ischaemic attacks by 15%, and prevent 100,000 cardiovascular events yearly in the USA alone.

Harder T, et al. Duration of breastfeeding and risk of overweight: a meta-analysis. Am J Epidemiol. 2005;162(5):397–403

A meta-analysis of 17 studies reporting duration of breastfeeding and the risk of being overweight. The duration of breastfeeding was inversely associated with the risk of being overweight and categorical analysis confirmed a dose-response association. The risk of being overweight was seen to be reduced by

4% for each additional month of breastfeeding and the benefits of breastfeeding are still apparent with partial or combination feeding. The definitions of being overweight and age had no influence. The paper supports a dose-dependent association between longer duration of breastfeeding and decrease in risk of being overweight.

Harmsen HJ, et al. Analysis of intestinal flora development in breast-fed and formula-fed infants by using molecular identification and detection methods. J Pediatr Gastroenterol Nutr. 2000;30(1):61–7

This study analysed the intestinal microbial compositions of six breast-fed and six formula-fed infants and confirmed the differences in development of intestinal flora between breast-fed and formula-fed infants. After initial colonisation of a complex flora in all infants, a selection of bacterial strains began in all infants. In all breast-fed infants, bifidobacteria became dominant, whereas in most formula-fed infants similar amounts of Bacteroides and bifidobacteria were found. The components of the faecal samples from breast-fed infants were mainly lactobacilli and streptococci, whereas samples from formula-fed infants often contained staphylococci, Escherichia coli and clostridia.

Moro G, et al. Dosage-related bifidogenic effects of galacto- and fructooligosaccharides in formula-fed term infants. J Pediatr Gastroenterol Nutr. 2002;34(2):291–5

A study looking at the dosage-related effects of GOS/FOS (prebiotics) in term infants. Two test formulas were supplemented with either 0.4 g/dL or with 0.8 g/dL oligosaccharides. In the control formula, maltodextrin was used as placebo. The findings from this study show that oligosaccharides result in a more preferable faecal bacteria: bifidobacteria and lactobacilli increased in both supplemented groups. Supplementation of prebiotics also improved stool consistency as the supplementation group of 0.4 g/dL showed softer stools than the control group. The results from this study indicate that supplementing infant formula with GOS/FOS stimulates the growth of bifidobacteria and lactobacilli in the intestine, and results in softer stools with increasing dosage of supplementation.

Michaelsen KF & Greer FR. Protein needs early in life and long-term health. Am J Clin Nutr. 2014;99(3):718S–22S

A review with the aim to summarise selected health aspects of protein intake during the first two years of life. This review makes conclusions from emerging data suggesting that a high protein intake can have negative effects, inducing a higher growth rate, which increases the risk of later overweight and obesity. The review concludes that it is important to: 1) consider lowering the upper limit of the protein content of various formulas used in the first year of life and 2) limit the intake of cow's milk, particularly reduced-fat cow's milk, during the second year of life because of its high protein content.

Koletzko B, et al. Lower protein in infant formula is associated with lower weight up to age 2 y: a randomized clinical trial. Am J Clin Nutr. 2009;89(6):1836–45

The Childhood Obesity Project study is a double-blind, randomised, multicentre, interventional trial. 1138 healthy term infants, in five European countries, were randomised either to receive a higher protein (HP) or lower protein (LP) content infant formula or were breast-fed for the first year of life. At 24 months, the average weight-for-length z-score in the lower protein formula group was lower than in the higher protein group, and was similar to that of the breast-fed reference group.

Weber M, et al. Lower protein content in infant formula reduces BMI and obesity risk at school age: follow-up of a randomized trial. Am J Clin Nutr. 2014;99(5):1041–51

A six-year follow-up of The Childhood Obesity Project found that infant formula with a lower protein content reduces BMI and obesity risk at school age. Avoidance of infant foods that provide excessive protein intake could contribute to a reduction in childhood obesity.

Kirchberg FF, et al. Dietary protein intake affects amino acid and acylcarnitine metabolism in infants aged 6 months. J Clin Endocrinol Metab. 2015;100(1):149–58

The protective effect of breastfeeding against later obesity may be explained by the lower protein content compared with formula milk. Branched chain amino acids (BCAA) seem to play a pivotal role in the effect of a high protein diet on

Further reading

-oxidation and fat storage. This paper provides new evidence for a possible saturation of the BCAA degradation pathway that may represent the mechanism by which high protein intake affects the metabolic regulation. Moreover, it appears to inhibit the initial step of the -oxidation, thus leading to high early weight gain and body fat deposition.

DiSantis KI. The role of responsive feeding in overweight during infancy and toddlerhood: a systematic review. Int J Obes. 2011;35(4):480–92

A chronic mismatch of caregiver responsiveness to infant-feeding cues, such as feeding when the infant is not hungry, is hypothesised to have a role in the development of overweight by impairing an infant's response to internal states of hunger and satiation. This systematic review adds evidence to the notion that a chronic mismatch between feeding and child cues contributes to the development of overweight and at the same time highlights the need for rigorous investigation of responsive feeding interactions in the first years of life.

Savage JS, et al. Effect of the INSIGHT responsive parenting intervention on rapid infant weight gain and overweight status at age 1 year: a randomized clinical trial. JAMA Pediatr. 2016;170(8):742–9

With the knowledge that rapid infant weight gain is associated with later obesity, this intervention aimed to examine the effect of responsive parenting on infant weight gain between birth and 28 weeks and overweight status at age one year. This study concludes that a responsive parenting intervention is associated with reduced rapid weight gain during the first six months after birth and overweight status at age one year.

Alexander DD, et al. Growth of infants consuming whey-predominant term infant formulas with a protein content of 1.8 g/100 kcal: a multicenter pooled analysis of individual participant data. Am J Clin Nutr. 2016;104(4):1083–92

A multi-centre pooled meta-analysis using individual participant data from 11 randomised controlled trials of six different countries. This study is based on the knowledge that high protein intake during infancy may contribute to obesity later in life in infants who are not exclusively breastfed. The study evaluated the growth of infants fed a whey-predominant, lower protein infant formula – 1.8 g/100 kcal (1.25 g/100 mL) (closer to breast milk and lower than standard infant formulas) with or without active ingredients – and the growth of breastfed infants, by comparing the anthropometric z-scores at four months against the 2006 WHO growth standards. The study concludes that whey-predominant infant formula with a lower protein content that more closely resembles that of breast milk supports healthy growth comparable to the WHO growth standards and close to breastfed infants.

'respond to the baby, not to the cry'

disease and diabetes for the population and for the health economy are a significant public health issue.

And it all starts in those first 1000 days.

Key points

- How and what an infant consumes may have long-term implications for their health outcomes.
- The midwife and health visitor have a duty of care to monitor the rate of infant weight gain and to make the mother aware of what it does and does not mean.
- While breastfeeding is always recommended, the midwife and health visitor must have access to all possible information on the nutritional content of formula feed, not to advise the mother on which to choose, but rather to make her fully aware of the choices.

Conclusion

Responsive breastfeeding will help ensure that the baby consumes the right quantity, grows at an appropriate rate, experiences less GI disorders and is more settled.

Responsive formula feeding with a formula that is lower in protein and supplemented with prebiotics may encourage a more settled baby with appropriate growth rates.



'it's not just about how you feed a baby, it's what you feed a baby too'



Delegate wish list for more settled babies

- More time for the health visitor to spend with mother and baby
- A feeding specialist to visit every mother in hospital
- Antenatal discussions with parents that prepare them with a realistic view of what having a baby will entail
- More specialist-led 'settled baby clinics'
- As a health visitor, time to spend with the mother antenatally to discuss feeding
- That mothers would stop clock-watching
- Better provision of early post-natal care. Too few mothers receive too little professional care once the excitement of the new arrival has subsided
- More information to leave with parents
- There are many apps. What would be ideal is, rather than everyone going their own way, to centralise on the site that houses the digital Red Book.

The roundtable 'The Settled Baby' was convened in London on 10 May and was funded by the Nestlé Nutrition Institute.

IMPORTANT NOTICE: The World Health Organisation (WHO) has recommended that pregnant women and new mothers be informed on the benefits and superiority of breastfeeding – in particular the fact that it provides the best nutrition and protection from illness for babies. Mothers should be given guidance on the preparation for, and maintenance of, lactation, with special emphasis on the importance of a well-balanced diet both during pregnancy and after delivery. Unnecessary introduction of partial bottle-feeding or other foods and drinks should be discouraged since it will have a negative effect on breastfeeding. Similarly, mothers should be warned of the difficulty of reversing a decision not to breastfeed. Before advising a mother to use an infant formula, she should be advised of the social and financial implications of her decision: for example, if a baby is exclusively bottle-fed, more than one can (400 g) per week will be needed, so the family circumstances and costs should be kept in mind. Mothers should be reminded that breast milk is not only the best, but also the most economical food for babies. If a decision to use an infant formula is taken, it is important to give instructions on correct preparation methods, emphasising that unboiled water, unsterilised bottles or incorrect dilution can all lead to illness.



41 Old Street, London EC1V 9HX

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T +44 (0)20 7214 0500 F +44 (0)20 7214 0501

E theresasaklatvala@cogora.com W www.cogora.com

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