



British Society of  
Paediatric Dentistry

Improving children's oral health

## **British Society of Paediatric Dentistry Position Statement on Infant Feeding**

**January 2018**

### ***Introduction***

All children in the UK deserve the best possible oral health, yet the annual figures for hospital admissions reflect the fact that thousands of children are being admitted to hospital for multiple dental extractions under general anaesthetic. Furthermore, 1 in 8 three-year-old children have obvious experience of dental decay according to a recent Public Health England survey.

Caries - dental decay - in young children can progress rapidly due to the porous and thinner enamel of baby teeth. Decay may lead to acute or chronic pain and infection which can have a significantly negative impact on quality of life. Early childhood caries (ECC) is the term to describe the presence of one or more decayed or filled tooth surfaces in a young child under 6 years of age.

It is essential that all healthcare practitioners who work with pregnant mothers and parents of young children are aware of relevant guidance regarding oral health and infant feeding. BSPD's position statement looks at the impact of ECC and current feeding practices in the UK with a summary of recommendations and prevention strategies. The guidance has been informed by the best available evidence and is intended to act alongside other UK policy documents.

### ***What is early childhood caries and what is its impact?***

Dental decay is caused by sugar in the diet metabolised by certain bacteria in the mouth to form acids which, within dental plaque, dissolve the tooth's mineral structure. In all of us, the amount and frequency of consumption of free sugars is the main aetiological factor. Free sugars include monosaccharides and disaccharides added to foods and drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, syrups, fruit juices and smoothies. It does not include sugars found naturally in whole fresh fruit and vegetables and those naturally present in milk (including human milk) and milk products. (Scientific Advisory Committee on Nutrition (SACN), 2015).

Dental caries can occur rapidly in infants and young children, and a number of terms such as 'baby bottle tooth decay' and 'nursing caries' have been used in the past. However, the shift to early childhood caries (ECC) as a moniker takes into account the multifactorial aetiology.

When considering the impact of ECC it must be viewed from an individual perspective, a family perspective and a wider social perspective with associated economic implications.

Pain and infection are common, along with difficulty eating, leading to failure to thrive, difficulty speaking and sleeping. As a consequence of this, children may miss school with parents and carers having to take time off work to care for their child. Children with ECC are also more likely to have caries in their permanent teeth and orthodontic problems due to premature loss of decayed teeth.

Dental caries was a leading cause of hospital admissions in England in 2014/15 with 33871 episodes of care for children aged 10 and under for extractions under general anaesthetic. The direct and indirect costs of ECC are difficult to quantify. However, extracting multiple teeth in children (under 5 years) in hospitals costs approximately £836 per child with a total NHS cost of nearly £50.5 million a year in 2015/16 in 0 – 19-year-olds.

### ***Current feeding practices in the UK***

The Infant Feeding Survey (IFS), published every five years, gives an indication of the ways in which parents nurture their children in the early months. The most recent survey, published in 2010, demonstrated that breastfeeding rates in the early first few days of baby's life have increased since 2005, from 76% to 81%. There are regional differences, with initial

breastfeeding rates higher in England at 83%, compared with 74% in Scotland, 71% in Wales and only 64% in Northern Ireland.

Government guidelines recommend exclusive breastfeeding for six months, but, in both the 2005 and 2010 surveys, only 1% of women were feeding in this way, with differences in prevalence associated with maternal deprivation. 88% have introduced infant formula or other milks by 6 months, and in fact 75% of all women surveyed had also introduced solid food by five months, despite Government guidelines which recommend commencing weaning at six months. Weaning may increase the caries risk factor for babies if they are partially dentate at that stage since free sugars may then be consumed in addition to milk, whether that is infant formula, human (breast) milk or cow's milk.

Soya drinks and other milk alternatives are usually sweetened with added sugars and therefore can be cariogenic (decay causing). Parents and carers should be advised that milk alternatives should only be used if medically recommended and if they are unsweetened, calcium-fortified versions. These drinks shouldn't be given to babies under one year old and rice drinks should not be given at all to children under five.

Information about breastfeeding broadly up to 6-8 weeks of birth is available through the Breastfeeding Initiation & Breastfeeding Prevalence 6-8 weeks Survey. This survey assesses whether the infant is breastfed or not and no other methods of feeding are explored. Data have been collected this way by individual National Health Service Primary Care Trusts (PCTs) – now known as NHS England Local Area Teams - since 2013, on a quarterly basis. Additionally, the UK-wide 2011 Diet and Nutrition Survey of Infants and Young Children adds to the information available. It shows that the vast majority of children aged 4-18 months are not breastfed. When compared with the IFS, similar numbers of mothers reported that their children were breastfed initially (78%) but 57% were not breastfed beyond 3 months. The statistics show that a small but significant number - 8% of 12-18 month olds - are still being breastfed as part of their diet.

Data from local authority areas and Diet and Nutrition surveys are useful but the IFS 2010 shows the most detailed current information. It would appear to be a useful resource to

gain detailed information about the prevalence of breastfeeding and its association with maternal age, ethnicity, area of residence and family support. From an epidemiological perspective, this knowledge is useful for planning healthcare interventions and targeted resources for caries prevention (since demographic and regional data are explored). However, the IFS was not repeated in 2015.

**BSPD supports** La Leche League and other groups in calling for the reinstatement of the IFS survey.

### ***Milk and Caries***

The dental caries experience of a child may be associated with the following factors:

- levels of Oral *Streptococci* (e.g *S mutans*)
- free sugars (in fruit-flavoured drinks, in solid foods or added to milk-based drinks)
- brushing with a fluoridated toothpaste
- developmental defects of dental enamel
- fluoride exposure
- vertical transmission of *S mutans* in infancy
- knowledge levels (linked to material deprivation)
- stress
- health beliefs

There are three main types of milk used to feed infants: human (breast) milk; infant formula milk, which aims to mimic breast milk, and bovine (cow's) milk. There is a difference in composition between different types of milk. Cow's milk contains less iron and nutrients than breast milk or infant formula milk making it unsuitable for introduction until after a child's first birthday. Conversely, whilst breast milk has the benefit of containing antibodies which can be passed from mother to child it also has nearly twice as much lactose and much less calcium and phosphate, both of which may increase its cariogenic potential. The cariogenic potential of bovine milk has been studied extensively. Although lactose in milk can be metabolised to form acids, bovine milk has been classed by the World Health

Organisation (WHO, 2003) as safe for teeth with the wording including 'possible decreased risk' of dental caries.

*In vitro* studies have demonstrated that infant formula, a modified cow's milk, may be acidogenic. Additionally, some research has seen higher caries rates when free sugars or other fermentable carbohydrates are added to the child's milk. The WHO advise against this practice. It is also probable that the length of time that the milk is in contact with the tooth will determine the likelihood of caries. Weaning then changes the oral environment so that bacteria become better able to metabolise milk sugars.

### ***Bottle feeding and caries***

It appears that it is not the consumption of milk that causes caries *per se*. Problems occur for different reasons. There is evidence that factors such as being bottle-fed as opposed to breast fed, night time bottle use, use of sugar or additions of cereal to the bottle, use of a bottle to pacify at night, bottles being carried around during the day, and still using a bottle at 18 months, all seem to be significantly associated with caries in young children. These factors create a difference between some *in vitro* findings of low cariogenicity of milk and epidemiological findings of *in vivo* associations of bottle-feeding and caries. There is particular issue regarding fruit-flavoured drinks consumed frequently from bottles or 'dinky feeders'. These drinks almost always contain substantial amounts of free sugars. As a UK government report said: 'thirsty children will drink water'.

### **BSPD recommends:**

- No fluid other than milk or cool boiled water should be given in a bottle and children should not be left with a bottle to suckle whilst asleep
- Extra sugars (e.g. table sugar) should not be added to bottles of formula feed or boiled water)
- Early introduction (from 6 months) of a free-flowing or open-top cup, in order to reduce the time that milk is in contact with the teeth, as per the Department of Health recommendations
- Bottle-feeding should be discouraged from one year

## **Benefits of breastfeeding**

Research has shown that breastfeeding up to 12 months of age is associated with a lower risk of ECC. BSPD supports breastfeeding where possible but also recognises that breastfeeding is not possible for all families. The reason that public health resources focus on breastfeeding as the best method of nurturing a child is that there are benefits for mother, her child and society at large. Good quality evidence suggests that the child can benefit from greater protection from a range of illnesses including gastrointestinal upset, otitis media, severe respiratory infections, asthma and obesity. Other benefits of breastfeeding are that the milk is free, available on demand at the correct temperature and increases feelings of achievement and mental wellbeing in the mother. Mothers can experience more rapid weight loss post-partum, and have a reduced risk of breast and ovarian cancers. It is likely, given the potential health benefits to mothers and babies, that breastfeeding may reduce the demand on healthcare services.

## ***Breastfeeding and caries***

While the oral health benefits of breastfeeding up to 12 months of age are very clear and are supported and promoted, the picture appears to change once the child reaches the age of one. Some of the research demonstrating a general association between breastfeeding and ECC after 12 months is not strong because it did not allow for confounding factors. These include the contribution of oral care (especially use of a fluoride toothpaste) and the consumption of other dietary sugars as the infant is introduced to complementary feeding. But there is a consensus view within the profession, supported by an emerging evidence-base, that on-demand and nocturnal breastfeeding after the age of 12 months, particularly in conjunction with drinks and foods containing free sugars, may contribute to caries. The natural history of caries as a disease which relies on time and frequency of consumption of sugars (as well as the quantity) as factors suggests that nursing throughout the night, with a frequency which is difficult to quantify, may be a factor in the development of ECC.

The World Health Organisation (WHO) currently recommends exclusive breast-feeding up to six months then the introduction of complementary foods alongside continued breastfeeding up to two years and beyond but these guidelines are currently under review.

**BSPD advises that:**

- Health professionals should encourage and support mothers to breastfeed their baby, if the mother is able to do so. When mothers cannot or do not breastfeed, they need support and advice on introducing bottle-feeding.
- From 12 months of age, mothers who wish to continue breastfeeding should work closely with their health practitioners to minimise the potential risk of dental decay. This may include the recording of a detailed diet diary identifying sugar in complementary foods and drinks, and discussing the optimal use of fluoride. Consideration should be given to reducing on demand and night time feeds in light of the emerging evidence-base suggesting a potential link between these practices and complementary feeding after 12 months of age and dental decay.
- From 12 months of age, where possible, the last feed should take place before tooth-brushing at bedtime so that the last thing on the child's teeth before they go to sleep is always fluoride toothpaste.
- Respecting the choices of parents and caring for their mental wellbeing is of paramount importance.

**BSPD would like:**

- To see good quality research designed to assess levels of ECC with breastfeeding as the exposure factor and controlling for confounders
- For the updated WHO guidelines on breastfeeding to consider the relative importance of continued breastfeeding beyond 12 months in developing versus developed nations.

***The difference between breastfeeding and bottle feeding***

There are mechanical differences between breast and bottle-feeding as well as chemical differences. A breast-fed infant will usually need to actively suck to receive milk, which means they will also be swallowing so the milk is less likely to pool in the mouth. The sucking and swallowing mechanism minimises contact between the teeth and the milk. The exception to this is during 'let downs' which may happen randomly. If let downs occur during the night whilst baby is asleep on the breast there will be pooling of milk into a

baby's mouth and the time that the milk is in contact with the teeth may be increased. With bottle feeding, the milk can flow without the sucking and swallowing mechanism so the time that the milk is in contact with the teeth may be similarly increased. Since caries requires a suitable surface, pathogenic bacteria (e.g. Mutans spp), a suitable substrate and importantly in this case, time to develop, this may explain why there could be differences in caries risk between breast and bottle-fed infants. However, since there is no current consensus on the clinical manifestation of this difference, BSPD eagerly awaits the results from a planned Cochrane review by Amit Arora and colleagues.

### ***The developing occlusion***

There is some good evidence that children who have been breastfed (vs not breast-fed) are less likely to develop malocclusions such as anterior open bite. This may be due to the difference in the use of the oral musculature involved in breastfeeding. Non-nutritive sucking habits such as dummies and digit sucking beyond the first year have similarly been linked with anterior open bite.

**BSPD recommends** that early withdrawal of a dummy or digit habit (e.g. thumb sucking) is to be encouraged - ideally before 1 year when psychological attachment can be formed.

### **BSPD Recommendation Summary**

1. Exclusive breastfeeding, where possible, before the introduction of solid foods at six months of age but where not possible, support and encouragement with bottle-feeding
2. Only breast or infant formula milk or cooled boiled water is to be used in a bottle
3. A free-flowing open-top cup for milk or water is to be introduced from six months
4. Bottle feeding should be discouraged from 12 months of age
5. From 12 months of age, mothers who wish to continue breastfeeding should work closely with their health practitioners to minimise the potential risk of dental decay. This may include the recording of a detailed diet diary identifying sugar in

complementary foods and drinks, and discussing the optimal use of fluoride.

Consideration should be given to reducing on demand and night time feeds in light of the emerging evidence-base suggesting a potential link between these practices and complementary feeding after 12 months of age and dental decay.

6. Habits such as dummy use and digit sucking be withdrawn by 12 months
7. Children should receive their first dental check by the age of one
8. Thereafter, the child should be seen on a recall basis appropriate to their caries risk as recommended by NICE guidelines (an appointment interval of between 3 months to a year)
9. As soon as teeth erupt brush twice daily with fluoride toothpaste last thing at night and at least on one other occasion, use of fluoridated toothpaste and other fluoride products appropriate to the child's age and caries risk status as recommended in Public Health England's Delivering Better Oral Health  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/367563/DBOHv32014OCTMainDocument\\_3.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/367563/DBOHv32014OCTMainDocument_3.pdf)
10. That the Infant Feeding Survey is reinstated and undertaken every five years in order to achieve fuller epidemiological data
11. Further research should be undertaken to establish whether breast or bottle feeding is associated with higher caries levels, and how this relates to other modifying factors
12. The WHO guidelines for breastfeeding beyond 12 months should reflect differing circumstances in developed nations

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