



# Diet Counseling During the Infant Oral Health Visit

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## Abstract

Diet counseling is an integral part of anticipatory guidance during the infant oral health visit. Similar to dietary instructions for children of all ages, the primary emphasis is on sugar intake frequency. There are, however, other infant-specific dietary issues that must also be addressed during the infant oral health visit. Breast-feeding should be promoted during the first year of life, although ad libitum nocturnal breast-feeding should be discouraged after the first primary tooth erupts. Bottle-fed infants should not be put to sleep with the bottle. Weaning from the breast or the bottle should be encouraged by 12 to 14 months of age. Infants older than 6 months and with exposure to less than 0.3 ppm fluoride in their drinking water need dietary fluoride supplements of 0.25 mg fluoride per day. Only 4 to 6 oz of fruit juice should be consumed by infants per day. Infants should not be given powdered beverages or soda pop, as these drinks pose increased risk for dental caries. Iron-fortified infant cereals, along with breast milk or infant formula, should be consumed by infants who are at least 6 months of age. Cow's milk should be completely avoided in the first year of life and restricted to less than 24 oz per day in the second year of life. Parents should be cautioned regarding the potential of various foods to constitute a choking hazard for infants. (*Pediatr Dent.* 2004;26:459-462)

**KEYWORDS:** DIET COUNSELING, INFANT ORAL HEALTH, BREAST-FEEDING, BOTTLE-FEEDING, INFANT-FEEDING PRACTICES

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The American Academy of Pediatric Dentistry (AAPD) recommends that "pediatric dentists should provide dietary counseling in conjunction with other preventive services for their patients."<sup>1</sup> As primary health care providers, pediatric dentists have the opportunity and potential to play a significant role in the development of positive dietary habits and promote good health in children. It has been remarked that "after children are 2 or 3 years of age, dentists see them more frequently than do primary care medical providers."<sup>2</sup>

The importance of diet counseling in childhood cannot be overstated. The American Academy of Pediatrics (AAP) recently issued a policy statement on the "prevention of pediatric overweight and obesity," noting that the "prevalence of overweight and its significant comorbidities in pediatric populations has rapidly increased and reached epidemic proportions."<sup>3</sup> "Body mass index at or above the 95th percentile is considered overweight or obese."<sup>3</sup> Currently, approximately 15% of American children and adolescents are considered to be obese.<sup>3</sup> The significance

of this observation is underscored by the finding that childhood body mass index predicts carotid artery intima-media thickness in adulthood, a marker for atherosclerosis in middle-aged and elderly populations.<sup>4,5</sup> Also, it has been noted that the incidence of type 2 diabetes mellitus is increasing among obese adolescents.<sup>3</sup>

Traditionally, pediatric dentists have counseled parents and children on issues regarding dietary factors that were considered to play an important role in children's dental health. This practice stems from classic cariogenicity studies, such as the Vipeholm dental caries study, describing dietary attributes for the development of dental caries lesions.<sup>6</sup> Based on these studies, pediatric dentists have primarily focused their diet counseling efforts upon the frequency of sugar consumption by children. This is in accordance with the AAPD's preventive pediatric dental care recommendation, suggesting that at the initial examination and at every recall appointment, pediatric dentists should discuss the role of refined carbohydrates and the impact of snacking frequency.<sup>7</sup>

In its guideline on infant oral health care, the AAPD recommends that “an initial oral evaluation visit should occur within 6 months of the eruption of the first primary tooth and no later than 12 months of age.”<sup>8</sup> It is further recommended that, during this infant oral health visit, anticipatory guidance should be provided on the effects of diet on the dentition.<sup>8</sup> This diet counseling recommendation bears merit, since a longitudinal study has shown that 3-year-old children with caries lesions had more frequent consumption of cariogenic foods at 12 months of age.<sup>9</sup>

Diet counseling issues remain similar among children of all ages though certain infant-specific issues do exist. This literature review’s objective was to summarize information pertinent to diet counseling during the infant oral health visit.

### **Breast-feeding**

The AAPD has endorsed the AAP’s policy on breast-feeding.<sup>10</sup> The AAP recommends breast-feeding as the ideal method of infant feeding, with exclusive breast-feeding for the first 6 months followed by the addition of iron-enriched solid foods between 6 to 12 months of age.<sup>11</sup> It has been observed that “infants who were fed breast milk more than infant formula, or who were breast-fed for longer periods, had a lower risk of being overweight during older childhood and adolescence.”<sup>12</sup> The AAPD suggests that “ad libitum nocturnal breast-feeding should be avoided after the first primary tooth begins to erupt.”<sup>13</sup>

### **Bottle-feeding**

Contrary to the AAP’s breast-feeding recommendation, many infants in the United States are not being breast-fed. Only 1 in 4 U.S. infants is breast-fed at 6 months of age.<sup>14</sup> Bottle-feeding, therefore, appears to be the predominant method of infant feeding, with about 95% of 6-month to 5-year-old children having used a baby bottle.<sup>15</sup>

Infant formulas are acidogenic and possess cariogenic potential.<sup>16,17</sup> Therefore, parents need to be made aware of the deleterious effects of inappropriate bottle usage and the need for good oral hygiene practices upon the first primary tooth’s eruption.<sup>13</sup> Parents should be counseled against putting their children to sleep with the bottle.<sup>13</sup>

### **Weaning**

The AAP suggests that infants be breast-fed for at least 12 months and “thereafter for as long as mutually desired.”<sup>11</sup> It has, however, been observed that “breast-feeding for over 1 year and at night beyond eruption of teeth may be associated with Early Childhood Caries.”<sup>18</sup> A similar relationship between dental caries and prolonged baby bottle use beyond 12 months of age has been suggested.<sup>19</sup>

It has been further reported that approximately 8% of 2- to 5-year-old US children continue to use the bottle.<sup>15</sup> Pediatric dentists should counsel parents to follow the AAPD’s suggestion that infants should drink from a cup as they approach their first birthday and be weaned from the bottle at 12 to 14 months of age.<sup>13</sup>

### **Dietary fluoride supplements**

The AAPD recommends daily fluoride exposure for all children as a primary preventive procedure.<sup>20</sup> An infant’s exposure to drinking water fluoride should be determined based on access to fluoridated water in community water supplies or through water analysis for those drinking well water.<sup>20</sup> Infants with access to fluoride in community water supplies but whose families are drinking bottled water or are using water filtration systems should be reviewed for the possible need for dietary fluoride supplements.

For infants older than 6 months of age who are exposed to water with less than 0.3 ppm fluoride, dietary fluoride supplements of 0.25 mg fluoride per day should be prescribed.<sup>20</sup> Irrespective of fluoride exposure in water dietary supplements should not be prescribed for infants under the age of 6 months.<sup>20</sup>

### **Fruit juice consumption**

The AAP suggests that infants should consume only 4 to 6 oz of fruit juice per day, representing 1 food serving of fruit.<sup>21</sup> Infants should be encouraged to consume mashed or pureed whole fruits.<sup>21</sup> The possibility of sugars being added in commercial preparations should be considered. The AAP cautions that “fruit juice offers no nutritional benefit for infants younger than 6 months.”<sup>21</sup> Malnutrition may be associated with excessive fruit juice consumption.<sup>21</sup> Also, juice drinks that have been reconstituted from concentrate may have added sweeteners.<sup>21</sup>

It has been observed that “juice and juice drinks appear to replace formula and milk intakes during the transition stage of infant nutrition” from 6 to 24 months of age.<sup>22</sup> Nine out of 10 children have consumed fruit juices by 1 year of age.<sup>21</sup>

### **Sippy cups and cariogenic substrates**

The AAP recommends that “infants should not be given juice from bottles or easily transportable covered cups that allow them to consume juice easily throughout the day. Infants should not be given juice at bedtime.”<sup>21</sup> Based on data from 1- to 5-year-old children in the longitudinal Iowa Fluoride Study, this stipulation against ad libitum fruit juice consumption can be extended to other cariogenic liquids such as soda pop, which are consumed via the bottle or sippy cup.<sup>23</sup> The Iowa Fluoride Study concluded that “consumption of regular soda pop, regular powdered beverages, and, to a lesser extent, 100% juice was associated with increased caries risk.”<sup>23</sup>

Following a systematic review on sugar consumption and caries risk, “it was concluded that the relationship between sugar consumption and caries is much weaker in the modern age of fluoride exposure than it used to be. Controlling the consumption of sugar remains a justifiable part of caries prevention, however, if not always the most important aspect.”<sup>26</sup>

### **Cereal consumption**

The AAP suggests that infants should be introduced to solid foods at 6 months of age, preferably iron-fortified infant

cereals or pureed meats.<sup>21</sup> Therefore, it is not surprising that “cereal is one of the first solid foods to be introduced into the infant diet in the United States.”<sup>24</sup> A suggestion exists that early exposure to cereals by 3 months of age may be associated with increased risk for type I diabetes mellitus.<sup>24</sup> At present, however, there is insufficient evidence to conclude that “infant cereal causes diabetes.”<sup>25</sup>

Laboratory evidence has suggested that consumption of presweetened cereals has cariogenic potential, depending on their sugar content.<sup>26</sup> The addition of milk reduced the cariogenicity of cereals, presumably by reducing the duration of oral retention.<sup>26</sup> Epidemiologic evidence, however, has found no association between cereal consumption and dental caries experience.<sup>27-29</sup> This lack of association between cereal consumption and dental caries experience in children might be due to the fact that “most children eat cereals with milk.”<sup>29</sup>

It has been suggested that cow’s milk should be completely avoided during the first year of life to prevent iron-deficiency anemia with its associated diminished mental, motor, and behavioral functioning.<sup>30</sup> Therefore, infants under the age of 1 year should be given their cereal with breast milk or infant formula. In the second year of life, an infant’s consumption of cow’s milk should be limited to less than 24 oz per day.<sup>30</sup>

Based on pragmatic assessment of the evidence, parents should be advised to give only iron-fortified infant cereals to their infants who are older than 6 months. They should be cautioned against indiscriminate infant consumption of sweetened cereals between meals, particularly when the cereal is not consumed along with milk or infant formula.

### Food and choking hazards

Parents should be cautioned regarding the potential of various foods to constitute an infant choking hazard. In general, the AAP suggests the food given to an infant should be “mashed or cut into small, easily chewable pieces.”<sup>31</sup> Aspiration of fruit-flavored gel snacks leading to upper airway obstruction and cardiopulmonary arrest in children has been reported.<sup>32</sup> Infants should never be given “nuts of any type, sunflower seeds, watermelon with seeds, cherries with pits, raw carrots, raw peas, raw celery, popcorn and hard candy.”<sup>33</sup> Soft foods such as “hot dogs, sausages, grapes, and caramels can be served if they are chopped into small pieces.”<sup>33</sup> Parents should exercise caution when giving infants foods like raw apples and pears that might be difficult to chew with few or no teeth.<sup>33</sup> Carrots and hot dogs should be quartered lengthwise and sliced into small pieces.<sup>31</sup> Infants should be given food only when they are seated and are supervised by an adult.<sup>31</sup>

### Recommendations

Based on accepted guidelines, the following recommendations can be made:

1. Infants should be breast-fed during the first year of life, although ad libitum nocturnal breast-feeding should be discouraged after the first primary tooth erupts.
2. Bottle-fed infants should not be put to sleep with the bottle.
3. Children should be weaned from the breast or the bottle by 12 to 14 months of age.
4. Infants older than 6 months and with exposure to less than 0.3 ppm fluoride in their drinking water need dietary fluoride supplements of 0.25 mg fluoride per day.
5. Parents should be advised to reduce their child’s sugar consumption frequency.
6. Infants should be allowed to consume only 4 to 6 oz of fruit juice per day. They should not be given powdered beverages or soda pop, as these drinks pose increased risk for dental caries.
7. Only iron-fortified infant cereals along with breast milk or infant formula should be given to infants who are older than 6 months of age. Cow’s milk should be completely avoided in the first year of life and restricted to less than 24 oz per day in the second year of life.
8. Parents should be counseled on the potential of various foods that constitute a choking hazard to infants.

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## ABSTRACT OF THE SCIENTIFIC LITERATURE



### AIR ABRASION VERSUS CLASSIC ENAMEL PREPARATION FOR SEALANTS

One of the primary factors in the long-term success of sealants can be directly attributed to a “leak-proof” margin between tooth and sealant material. In this study, the microleakage of sealant material was evaluated after air abrasion and classic enamel preparation methods. Ninety teeth were divided into 3 groups. All of the teeth had the mesial half of the occlusal surface prepared using air abrasion followed by acid etch. The distal half of the occlusal surface was prepared by 1 of 3 methods: (1) acid etch alone; (2) mechanical widening of fissures followed by acid etch; or (3) air abrasion alone. After sealant application, teeth were thermocycled and then subjected to a blue dye for microleakage detection. Those samples which utilized air abrasion alone had significantly higher amounts of leakage compared to all other enamel preparation methods.

**Comments:** Although this study is narrow in scope, the authors state that microleakage is only one variable in the possible causes of sealant failure. Bearing this in mind, pediatric dentists should not overlook the significance of acid etching in sealant preparation, nor be tempted to skip this seemingly vital step in the interest of speed and/or time management. **GM**

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**Microleakage of a pit and fissure sealant: Effect of air abrasion compared with classical enamel preparations. *J Adhes Dent*. 2004;1:43-48**

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