Infant/toddler oral health care: Guidelines for the primary care physician

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Abstract

Since primary care physicians treat infants and toddlers on a regular basis, they oversee the growth and development of children and are usually the first health care providers to evaluate their oral health status. When examining an infant or a toddler, certain oral health conditions should be considered, such as tooth eruption, fluoridation, preventive oral hygiene, diet, and orofacial development. This article provides pertinent information in these areas that can serve as a guide for primary care physicians in their routine care of the infant/toddler.

Introduction

The majority of newborns receive regular medical care during their first few years of life. The physician monitors their overall health by regularly doing a comprehensive infant/toddler examination in which special attention is focused on determining proper fine and gross motor, language, and self-help skills, as well as cognitive and social/emotional development.

The primary teeth are important for chewing, speaking and appearance, as well as serving to maintain adequate spacing for the permanent teeth. Early loss of primary teeth can lead to severe malocclusions and oral dysfunctions. In order to assure optimum health of the oral structures, early preventive care should be initiated. Since primary care physicians treat many children who do not regularly visit the dentist, this article attempts to summarize areas of oral health concerns that are of importance when examining infants or toddlers.

Eruption

The early years of life are critical in the development of the orofacial structures. The calcification of the primary tooth follicles begins about 3 to 4 months in utero starting with the primary incisors and is complete by the third postnatal month. Disturbances of the calcification process can result in hypoplasia of the enamel forming at that time. Therefore, the primary teeth can be a record of fetal development and provide valuable information on the timing of insults occurring pre-, peri, or early postnatally (1).

Even the normal physiological event of birth is recorded in the enamel and dentin of the primary teeth as a neonatal line (2). Little association, though, has been found between tooth eruption and other stages of childhood development such as height, weight, etc. However,

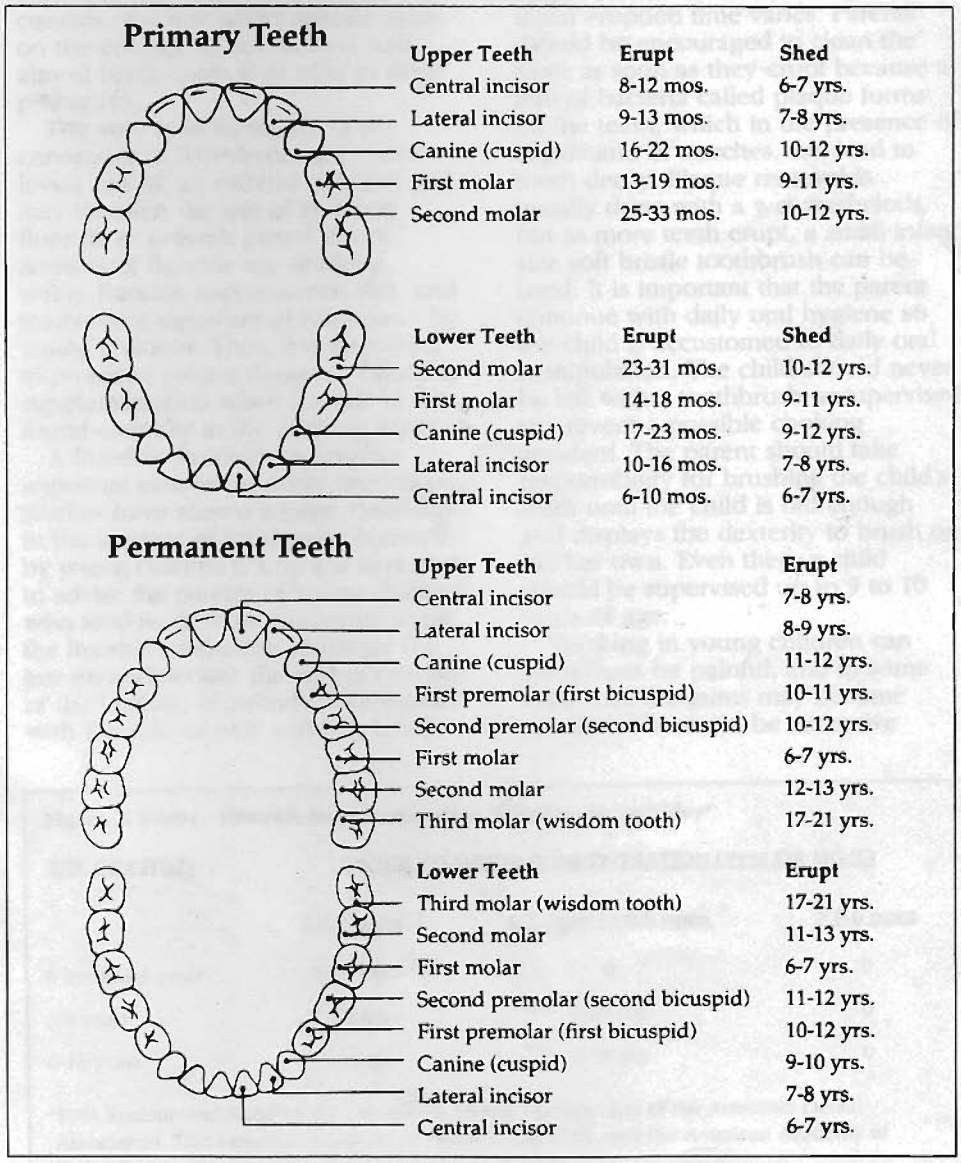

Figure 1. Tooth Eruption and Exfoliation Chart ***"Copyright by the American Dental Association. Reprinted by Permission."***

there has been noted a genetic influence or familial trend with regard to early and/or late eruption (3).

At birth, the crowns of all 20 of the primary teeth are almost completely formed and are present in the jawbones. In addition, the formation of the first permanent molar has already begun.

The entire primary dentition has usually erupted by the second to third year of life. Spacing between primary teeth is common. A lack of spacing could be an indicator that the permanent teeth may be crowded.

By the age of 3, most of the hard tissues in the permanent dentition have already been formed. Thus, injuries to an infant/toddler may result in disturbances in the permanent dentition.

Eruption of the permanent teeth comes later, usually at 6 to 13 years of age. Age of eruption of the permanent teeth is usually more variable than the primary teeth with girls usually ahead of boys. In addition, Caucasians usually erupt at a later age than most races (4).

The first permanent tooth to erupt is the first molar. It erupts posterior to the last primary molar and its eruption is not preceded by the loss of a primary tooth. Parents are many times unaware of its presence. The first permanent molar is the cornerstone of the dental arch and should last a lifetime. An eruption chart of the primary and permanent dentition is illustrated in Figure 1.

Fluoride supplementation

The use of fluorides was probably one of the most remarkable discoveries in preventive medicine/dentistry. By the early 1940s, it was established that .7 to 1.2 parts per million fluoride supplementation of the water supply could reduce cavities in the primary dentition by 40%-50% and permanent dentition by 50%-60% for children drinking fluoridated water from birth (5).

By 1994, however, the fluoride supplementation schedule recommended by the Council on Dental Therapeutics of the American Dental Association, the American Academy of Pediatric Dentistry, and the American Academy of Pediatrics suggested that infants who do not live in areas with a fluoridated water supply should start fluoride supplementation at 6 months of age. The specific recommendations are outlined in Figure 2.

If one is unsure as to whether the water supply is fluoridated in a specific area, the water should be tested for fluoride content. Water from a municipal water supply may or may not contain fluoride, so individuals should contact their local municipal water supply company or the West Virginia Public Health Department to obtain information on fluoride content. Most private water supplies in West Virginia have only traces of fluoride, occasionally more. The West Virginia Public Health Department Fluoride Supplementation Program provides water analysis and fluoride supplements free of charge. Physicians can enroll in this program and receive these services.

The prevalence of dental fluorosis has increased since the 1940s in both fluoridated and non-fluoridated communities because of the increased exposure to systemic fluorides. Fluorosis can range from mild, which consists of a few white opaque areas on the enamel, to tan, brown, and almost black spots with mild to deep pitting (6).

The very mild forms are of no consequence. However, more severe levels can be an esthetic concern and may threaten the use of systemic fluoride to prevent dental decay. Sources of fluoride are drinking water, fluoride supplements, diet, and inadvertent ingestion of toothpaste by young children. Thus, it is important to prescribe proper dosages of fluoride supplementation when fluoride is not found naturally in the drinking water.

A fluoride dentifrice is another important element in cavity prevention. Studies have shown a large variability in the amount of toothpaste ingested by young children (7), so it is important to advise the parents of young children who tend to swallow toothpaste to use the fluoride toothpaste sparingly (i.e. just enough to wet the end of one tuft of the bristles). Currently, toothpastes with fluoride display warning labels on their packages for children under six years of age.

In spite of the already accepted therapeutic effect of systemically-ingested fluoride, prenatal fluoride supplementation is still a controversial issue. Research studies have shown that fluoride does pass the placental barrier in pregnant women and is stored in the placenta. However, the clinical and statistical evidence supporting the benefit of prenatal fluoride supplementation is inconclusive. At this time, the American Academy of Pediatric Dentistry does not support the administration of prenatal vitamins containing fluoride (8).

Plaque control

In general, the first primary tooth erupts around 6 months of age. This initial eruption time varies. Parents should be encouraged to clean the teeth as soon as they erupt because a film of bacteria called plaque forms on the teeth, which in the presence of sugars and or starches, can lead to tooth decay. Plaque removal is usually done with a wet washcloth, but as more teeth erupt, a small infant size soft bristle toothbrush can be used. It is important that the parent continue with daily oral hygiene so the child is accustomed to daily oral manipulation. The child should never be left with a toothbrush unsupervised to prevent a possible choking accident. The parent should take responsibility for brushing the child's teeth until the child is old enough and displays the dexterity to brush on his/her own. Even then, a child should be supervised up to 9 to 10 years of age.

Teething in young children can sometimes be painful, and in some instances, the gums may become swollen. There can be excessive

Figure 2. Dietary Fluoride Supplementation Schedule in mgF/day*

AGE OF CHILD	WATER FLUORIDE CONCENTRATION (PPM OR MG/L)		
	< 0.3 ppm	0.3 ppm to 0.6 ppm	> 0.6 ppm
6 months-3 years	0.25 mg	0	0
3-6 years	0.50 mg	0.25 mg	0
6-16 years	1.0 mg	0.50 mg	0

*1994 Recommendations by the Council on Dental Therapeutics of the American Dental Association, The American Academy of Pediatric Dentistry, and the American Academy of Pediatrics.

drooling, and general malaise. Treatment for teething is symptomatic i.e., proper dosage of acetaminophen, chilled or unchilled teething toys, and/or digital massage.

Dietary concerns

When food containing refined carbohydrates and particularly simple sugars such as sucrose is eaten, concentrated acid is built up around the teeth. If teeth are not clean, the acid works on the plaque and starts to break down the teeth. The strongest evidence linking intake of sugars to high cavity rates is the frequency of consumption such as between meal snacking (9), so early dietary counseling is helpful.

Limiting the child to two snacks a day may be helpful, and non-sugar snacks are the best. If teeth are clean, the decay process cannot occur in spite of the sugar consumed. Parents should be advised that the child should never be put to bed with a bottle containing anything but water. In addition, the bottle should not be used as a pacifier.

When the bottle is used as a pacifier, especially when an infant/toddler is put to sleep with the bottle, the sugars from the formula, juice, etc., pool on the teeth and can lead to rampant decay of primary teeth. This condition is referred to as nursing bottle caries or baby bottle tooth decay, and it can develop within a few weeks after the eruption of the primary teeth.

The child can develop an infection from the carious teeth. This condition is clearly related to the habit of using the bottle as a pacifier or nursing from the bottle or breast for extended periods of time. Thus, nursing bottle caries has been found to run in families. It is important to review the family history of decay and infant feeding practices. This situation can be prevented with early intervention to promote good oral hygiene and proper feeding habits.

Orafacial development

In assessing normal and abnormal orofacial development, the first step is to ask the child to bite the back teeth together, and hold the position while you are facing him/her. Teeth in general reflect the skeletal relationships and help in identifying possible jaw disharmony.

If the top teeth come together behind the bottom teeth (Figure 3), the child has an underbite or a Class III malocclusion. Often, this is due to the upper jaw which is too far back or too small, or the lower jaw which is too far forward or too large. This condition occurs in about 1%-5% of the Caucasian population, but 14% in Asians. Early orthodontic treatment is helpful in promoting proper orofacial growth and development, and treatment can usually be initiated at 4 to 5 years of age.

More frequently, though, the upper teeth are more than 3-5 mm in front of the lower teeth. This is a Class II malocclusion or an overbite. This type of malocclusion occurs in 15%-20% of the population, and these problems are usually addressed during the child's maximum growth period or a few years before puberty.

Occasionally, the top side teeth on one or both sides are inside of the bottom teeth (Figure 4). This is a significant problem called a crossbite and it occurs in 5% of the population. Generally, the upper jaw is too narrow, and children with this type of problem sometimes shift their jaw to one side because their teeth do not occlude well. This type of problem should be addressed immediately since crossbite with a jaw shift could lead to asymmetric jaw growth.

Another childhood dental problem that can develop is an openbite or spaces between the front teeth. This occurs in children who have a persistent thumb or digit habit, so it is critical that children be discouraged from sucking their fingers or pacifiers when they are four years or older. In most cases, when the habit is stopped, the teeth will erupt together. If these habits are not discontinued with oral instruction, the parent should consult their pediatric dentist for an appliance to help.

Conclusion

Oral health of infants/toddlers should be a very important concern for primary care physicians. Children in West Virginia have a rate of loss of first permanent (six year) molars that exceeds any other state (10).

Primary care physicians in West Virginia are critical in the overall Public Health mission which includes providing a positive environment for the development of optimal oral health. Identification of the problems described and their appropriate management or referral will significantly improve the oral health of the children in our state.

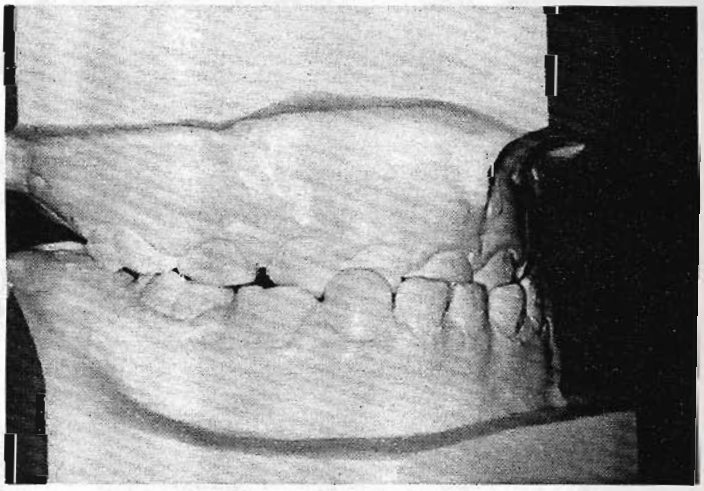

Figure 3. A 5-year-old patient with an underbite or Class III malocclusion due to undergrowth of the upper jaw.

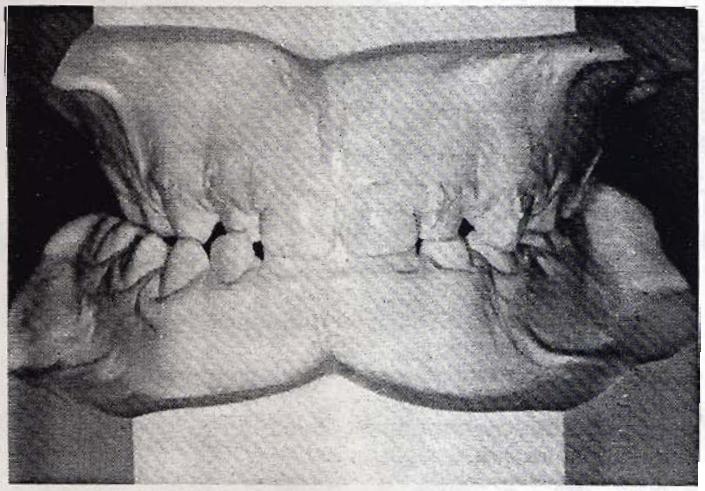

Figure 4. A 4-year-old patient with a crossbite. Note the top side teeth and patient's right side is inside of the bottom teeth.

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