Open Mouth, Open Mind: Expanding the Role of Primary Care Nurse Practitioners CE

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ABSTRACT

Oral health is essential to overall health at any age, although in children it is particularly important because poor oral health can have a deleterious effect on deciduous and permanent dentition. For decades, oral health providers have urged primary care providers to incorporate oral health assessment, risk factor identification, parent education, and preventive therapy into routine well-child visits. Despite recommendations from various professional associations and governmental organizations, the incidence of dental disease in young children remains relatively unchanged. Although the literature has clearly demonstrated that preventive care treatments, such as the application of fluoride varnish performed in the primary care setting, improve oral health in children, very few primary care providers include oral health services in their well-child visits. The purpose of this article is to reduce the barriers and knowledge gaps identified in recent pediatric oral health research and educate primary care nurse practitioners on the application of fluoride varnish to reduce the risk of the development of dental caries in young children. J Pediatr Health Care. (2015) *30*, 480-488.

KEY WORDS

Pediatric oral health, fluoride varnish, early childhood caries

OBJECTIVES

1. Summarize the definition and epidemiology of early childhood caries.
2. Analyze the most current evidence-based recommendations for prevention of early childhood caries.
3. Utilize risk factors for early childhood caries to guide oral health education for families.
4. Identify signs of early childhood caries indicating the need for referral to a dentist.
5. Promote the integration of fluoride varnish use into the primary care setting.

Dental caries was identified as a significant yet preventable health problem in young children generations ago. To address this issue, in 1978 the American Academy of Pedodontics (since 1984, also known as The American Academy of Pediatric Dentistry [AAPD]) and the American Academy of Pediatrics (AAP) released a joint statement, *Nursing Bottle Caries*, to recommend that parental education be aimed at discontinuing baby bottle use in infants as soon as possible after the first birthday (AAPD, 2014a). According to the National Health and Nutrition Examination Survey (NHANES) data from 1988-1994, the prevalence of dental caries was 24% among children ages 2 to 5 years, making it

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the most common chronic disease in childhood (five times more common than asthma; Moyer, 2014). In 1999, upon recognizing that this disease was multifactorial because it was seen in children who did not use baby bottles, dental experts and organizations agreed to cease using the term "nursing bottle caries" and settled upon common definitions of dental caries in young children. Early childhood caries (ECC) is defined as "one or more decayed (noncavitated or cavitated lesions), missing (due to caries), or filled tooth surfaces" in any primary tooth in a child younger than 6 years. Severe childhood caries is defined as any sign of caries on a smooth surface of a tooth (noncavitated or cavitated) prior to 3 years of age (AAPD, 2014a). In 2000, the Surgeon General's Report on Oral Health included information on ECC to increase public awareness, and at the same time the Centers for Disease Control and Prevention (CDC) made a goal in the Healthy People 2010 initiative, setting the prevalence threshold of ECC at 11% for children ages 2 to 5 years as a health determinant. Unfortunately, this goal was not met, and there was actually a 33% increase of caries in this population. The most current NHANES data from 1999-2004 showed a prevalence of ECC in 28% of children (Moyer, 2014). Furthermore, the survey found that 72% of tooth surfaces in children ages 2 to 5 with caries were untreated (Tinanoff & Reisine, 2009).

During the past two decades, the AAPD has made eight revisions to the original statement on "baby bottle" tooth decay. Today this document is entitled *Policy on Early Childhood Caries (ECC): Classifications, Consequences, and Preventive Strategies* and was last revised in 2014 (AAPD, 2014a). With each revision, current research data were evaluated and new caries prevention strategies were implemented. Despite all of the recommendations, as well as innovative products and services, the prevalence of ECC has remained relatively unchanged. Several of these preventive strategies called for primary care providers to incorporate oral health services, including oral assessment, risk factor evaluation, systemic fluoride supplementation, and topical fluoride varnish application, into the well-child visit. According to the AAP, approximately 90% of infants and 1-year-olds have seen a primary care clinician, yet fewer than 2% have seen a dentist (Clark, Slayton, & Section on Oral Health, 2014). Thus the primary care clinician is positioned as an obvious resource for recommended services such as fluoride varnish application in infants and children. It is estimated that only 4% of primary care practices perform fluoride varnish application, with training deficits cited as a major barrier (Moyer, 2014). In 2014, the U.S. Preventive Services Task Force (USPSTF) published simplified recommendations to further encourage primary care clinicians to identify risk factors, prescribe systemic fluoride supplementation if indicated, and apply fluoride varnish to the primary teeth of all children 5 years or younger beginning at the eruption of the first primary tooth (Clark et al., 2014; USPSTF, 2014).

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EARLY CHILDHOOD CARIES

ECC is a chronic, infectious disease that is orally transmitted from family members to infants and young children. This microbiological process begins silently with the accumulation of plaque on tooth surfaces. Plaque is a type of biofilm—that is, a collection of bacteria and other microorganisms mixed with saliva that forms a sticky substance that clings to teeth (Mahat, Lyons, & Bowen, 2014). With the consumption of dietary carbohydrates such as sucrose, glucose, fructose, and cooked starch, the cariogenic bacteria in the plaque, mainly *Streptococcus mutans,* thrive and multiply. These fermentable carbohydrates, once metabolized by the bacteria residing in the plaque, form an acid that can rapidly demineralize the tooth enamel. Fortunately, this process can be reversed through remineralization of the tooth surfaces with the frequent application of fluoride by means of a fluoridated dentifrice (toothpaste) or application of a fluoride varnish and the ingestion of fluoridated water or fluoride supplements. The advantage of multiple fluoride sources is that the effects on the tooth surface are cumulative. Saliva has protective properties, and when adequate fluoride is available, it bathes the teeth with fluoride and calcium and other minerals to counterbalance the mineral loss from the aciduric bacteria in the plaque. However, if fluoride exposure is not adequate from any single source or combination of sources, demineralization will occur more rapidly than remineralization and cavitation will likely result.

The first sign of ECC is the appearance of white spots on the surface of the tooth indicating a loss of mineral on the enamel surface. The lesions can appear on any tooth surface but often appear along the gum line of the maxillary primary incisors and first molars, where plaque often accumulates. They are best visualized by drying the teeth with gauze and using a good light source. At this point, EEC is still reversible if the causative factors are identified and minimized. Application of fluoride varnish to the teeth, proper home care, lessening the frequency of carbohydrate consumption, and caregiver education to further reduce risk factors may result in a complete eradication of the carious lesion. All children identified as having white spot lesions are considered to have ECC and need immediate referral to a dentist (Figure 1). If the process is not counterbalanced with remineralization, eventually the