

# Policy on Use of Xylitol in Pediatric Dentistry

## Latest Revision

2020

### Purpose

The American Academy of Pediatric Dentistry (AAPD) recognizes that there is considerable research on sugar substitutes, particularly xylitol, and their potential oral health benefits for infants, children, adolescents, and persons with special health care needs. This policy is intended to assist oral health care professionals making informed decisions about the use of xylitol-based products with the aim of preventing caries in children.

### Methods

This policy was developed by the Council on Clinical Affairs and adopted in 2006.<sup>1</sup> This document is an update of the previous version, revised in 2015.<sup>2</sup> The update is based upon a review of current dental and medical literature related to the use of xylitol in caries prevention. A literature search was conducted using PubMed®/Ovid with the terms: xylitol AND dental, systematic review; field: all fields; limits: within the last 10 years, humans, English, birth through 18. Twenty-three articles matched these criteria; 16 systematic reviews and/or meta-analyses were reviewed for this revision. When data did not appear sufficient or were inconclusive, policy was based upon expert and/or consensus opinion by experienced researchers and clinicians.

### Background

Xylitol is a five-carbon sugar alcohol derived primarily from forest and agricultural materials.<sup>3</sup> It has been used since the early 1960s in infusion therapy for post-operative, burn, and shock patients, in the diet of diabetic patients, and as a sweetener in products aimed at improved oral health.<sup>3</sup> Dental benefits of xylitol first were suggested from Finnish studies using animal models in 1970.<sup>4</sup> The first xylitol studies in humans, known as the Turku Sugar Studies,<sup>5,6</sup> demonstrated the relationship between dental plaque and xylitol, as well as the safety of xylitol for human consumption. Xylitol as well as other sugar alcohols are not readily metabolized by oral bacteria and, thus, are considered non-cariogenic sugar substitutes.<sup>6</sup>

Xylitol is available in many forms (e.g., gums, mints, chewable tablets, lozenges, toothpastes, mouthwashes, cough mixtures, oral wipes, nutraceutical products).<sup>7</sup> The chewing process enhances the caries inhibitory effect, which may be a significant confounding factor for the efficacy of xylitol gum.<sup>7-14</sup> Multiple systematic reviews regarding xylitol show varying results in the reduction of the incidence of caries, transmission of mutans streptococci (MS) from mothers to

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children, and MS levels in children.<sup>5-11,13-16</sup> Such studies have been performed with xylitol intake ranging from four to 15 grams per day divided into three to seven consumption periods.<sup>7-9</sup> Abdominal distress and osmotic diarrhea have been reported following the ingestion of xylitol.<sup>7-13,15-18</sup>

Overall results of systematic reviews suggest insufficient evidence to show xylitol products reduce caries.<sup>7-13,15-18</sup> All xylitol studies were reported to have design issues and/or bias (e.g., insufficient sample size, control group issues, inconsistent results, randomization, blinding, conflict of interest).<sup>7-13,15-18</sup> Data is inconclusive for caries reduction for short-term use.<sup>7-13,15-18</sup> Data also is inconclusive for long-term effectiveness for reduction of MS and caries reduction.<sup>7-13,15-18</sup> Most studies used a very large dose and at high frequency (generally four to five times a day), which may be unrealistic in clinical practice.<sup>10-12</sup>

### Policy statement

The AAPD:

- supports the use of xylitol and other sugar alcohols as non-cariogenic sugar substitutes.
- recognizes that presently there is a lack of consistent evidence showing significant reductions in MS and dental caries in children.
- recognizes that the large dose and at high frequency of xylitol used in clinical trials may be unrealistic in clinical practice.
- supports further research to clarify the impact of xylitol delivery vehicles, the frequency of exposure, and the optimal dosage to reduce caries and improve the oral health of children.

### References

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### ABBREVIATIONS

**AAPD:** American Academy Pediatric Dentistry. **MS:** mutans streptococci.

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