Health Benefits of Xylitol Recognized by AAPD

The American Academy of Pediatric Dentistry (AAPD) recognizes the caries preventive benefits of xylitol. Its policy, based on current scientific research, assists dental professionals in making informed decisions on the use of xylitol products for caries prevention. The original xylitol policy was adopted in 2006, with this update in 2010.

A total of 240 articles were reviewed pertaining specifically to xylitol use for caries prevention, with 25 reviewed for the 2010 update.

The dental benefits of xylitol were first recognized in Finland in 1970. In 1975, the first xylitol-sweetened chewing gum was developed. The Turku Sugar Studies were the first xylitol studies in humans showing a relationship between dental plaque and xylitol. Early studies comparing sucrose-sweetened to xylitol-sweetened chewing gum reported caries rates one-third as high in the xylitol group compared to the sucrose group.

A long-term study published in 1995 comparing xylitol, sorbitol and sucrose consumption revealed lower plaque scores and lower levels of salivary bacteria in the xylitol group.

Studies suggest xylitol consistently produces positive results with 4-10 grams per day divided into three to seven exposures. Higher daily intake doesn’t provide advantages, while frequency of less than three exposures provides no benefit.

Benefits of daily xylitol consumption include reduced plaque formation, reduced bacterial adherence and prevention of enamel demineralization. Long-term effects demonstrated benefits at five years after xylitol-sweetened chewing gum. Xylitol currently is available in many forms: gums, mints, chewable tablets, lozenges, toothpastes, mouthwashes, cough mixtures and nutraceutical products. Other xylitol products are being studied.

Xylitol Prevents Transmission of Bacteria from Mother to Child

Baseline data was taken during pregnancy and all mothers showed high salivary levels of MS. The 106 mothers in the xylitol group began chewing xylitol-sweetened gum three months after delivery of their babies. There were 66 women in the two varnish groups. The children received no treatment. MS were measured in the mothers’ saliva every six months for two years.

The mothers’ salivary MS levels remained high among the three study groups throughout the study. At two years of age, the MS transmission from mothers to children was lowest in the xylitol group, 9.7 percent of children had MS in saliva, compared to 29 percent in the chlorhexidine varnish group and 49 percent in the fluoride varnish group.

Clinical Implications: A mother’s use of xylitol chewing gum during the first two years of their child’s life will reduce MS transmission to the child’s mouth.


Clinical Implications: The AAPD supports the use of xylitol as part of a preventive strategy.

Oral Probiotics Reduce Cariogenic Bacteria in Children

Two over-the-counter oral probiotics are now available to control cariogenic bacteria: PerioBalance by Sunstar Butler and EvoraKids by Oragenics. PerioBalance uses Lactobacilli reuteri and EvoraKids uses ProBiora3, a blend of Streptococcus oralis, Streptococcus uberis and Streptococcus rattus.

Researchers at Children’s Memorial Hospital in Chicago, Illinois, tested PerioBalance and EvoraKids on children found to be at moderate to high caries risk using a caries risk assessment system (CAMBRA). The 60 children involved in this study were ages six to 12. The oral probiotic lozenges were taken daily for 28 days.

Baseline saliva samples were collected and the Caries Risk Test (CRT) from Ivoclar was used to measure Strep mutans (SM) and Lactobacilli. The process of the CRT incubates saliva samples applied to two agar carriers placed in an incubator for 48 hours. SM grow blue colonies on the agar carrier and Lactobacilli grow white colonies. The CRT was repeated at six to eight weeks.

Both test groups showed significant reductions in the number of colony-forming units of oral bacteria from baseline to end of study. PerioBalance SM values were reduced -6.78 and Lactobacilli -5.762. EvoraKids SM values were reduced -7.33 and Lactobacilli -2.952.

Clinical Implications: Over-the-counter oral probiotics are effective in decreasing cariogenic bacteria in children found to be at moderate to high risk of caries.


Oral Probiotics and Experimental Gingivitis

Oral probiotics in the form of mints or chewing gums introduce healthy bacteria to the oral cavity. The goal is to change the balance of the oral flora to one of health. Lactobacillus reuteri (L. reuteri) colonizes the intestines of healthy humans. It was isolated in the 1960 by microbiologist Gerhard Reuter, after whom it was later named. L. Reuteri produces an antibiotic substance that can kill harmful oral bacteria causing caries or periodontitis.

Researchers at the University of Texas in Houston wanted to know if introducing an oral probiotic when subjects performed no oral hygiene would prevent experimental gingivitis. A group of 53 adults participated in this study. Baseline data included gingival index, plaque index and unstimulated saliva to test for bacteria. All subjects received a prophylaxis and were instructed to refrain from all oral hygiene for two weeks and chew their assigned gum once daily. The test group of 26 subjects was given chewing gum containing L. reuteri, and the control group of 27 subjects was given the placebo chewing gum. Both subjects and examiners were blinded to group assignments.

At two weeks and four weeks both groups showed significantly increased plaque levels and gingivitis scores. There were no differences between groups for these clinical indices. Saliva samples from all subjects in the control group tested negative for the presence of L. Reuteri. In the test group, 40 percent of saliva samples tested positive for the presence of L. reuteri.

Clinical Implications: A probiotic chewing gum can introduce and promote colonization of good bacteria, but once daily is not enough to prevent experimental gingivitis.


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Comparison of Water Flosser and Air Floss

New alternatives are needed for cleaning between the teeth, since compliance with dental flossing with string floss is so low. Flossing with water has been available for many decades from WaterPik and a new interdental cleaning device is now available from Philips Sonicare, the Air Floss. This device combines a puff of air with a small amount of water directed between the teeth.

Researchers at BioSci Research in Canada compared the WaterPik Water Flosser and the Philips Sonicare Air Floss in a group of 82 subjects over four weeks. All subjects used a manual toothbrush plus their assigned irrigation device. Instructions were both written and verbal and were repeated at two weeks. Gingivitis, bleeding and plaque scores were recorded at baseline, two weeks and four weeks.

At two weeks and four weeks, both groups showed significant clinical improvement compared to baseline. Those using the Water Flosser demonstrated significantly more effective reductions in both plaque and gingivitis at week two and week four in all areas measured. At the end of the study, gingivitis was reduced more in the Water Flosser group compared to the Air Floss group. At four weeks, full-mouth plaque levels were 51 percent in the Air Floss group compared to 30 percent in the Water Flosser group. For the air floss group, plaque levels were higher on approximal surfaces, 77 percent compared to 48 percent, and 53 percent on facial surfaces compared to 36 percent.

Clinical Implications: The Water Flosser is more effective for plaque removal and reducing gingivitis than the Air Flosser.


Tongue Cleaning Reduces Bad Breath

Everyone has bad breath sometimes, and some people have chronic bad breath all the time, from 25 to 50 percent, depending on the population. Morning bad breath is due to overnight dryness when saliva flow is at its lowest, enhancing the growth of oral bacteria. Bacterial biofilm accumulates on and around the teeth, and is also part of tongue coating, especially on the dorsum of the tongue. Eating and drinking in the morning tends to eliminate overnight bad breath, but sometimes it is a chronic problem.

Ninety percent of bad breath can be attributed to oral causes including caries, periodontal disease, poor oral hygiene and tongue coating. The gold standard of measuring bad breath is organoleptic testing or smelling the person’s breath. It is also measured by the level of unpleasant-smelling volatile sulfur compounds (VSC) in the mouth air.

Researchers at three universities in The Netherlands reviewed the research to determine if tongue cleaning with a scraper or toothbrush in addition to regular oral hygiene would reduce oral malodor. Of the 405 studies and abstracts their search produced, 22 full-text articles were read and 17 of these were excluded as they didn’t match the established criteria they were looking for in the studies. The five studies that did fit all criteria were evaluated and compared, showing that tongue scraping or brushing does reduce oral malodor. These studies did not evaluate chronic bad breath.

Clinical Implications: Results of this systematic review suggest that cleaning the dorsum of the tongue with a scraper or brush will reduce oral malodor.