The many sides of xylitol

By Sandra Berger, RDH, BS

What is xylitol? How does it work? How long has it been around? How does it benefit me? Where do I find it? How much do I need? Are there any disadvantages?

These are some of the questions I am asked by my patients, friends and even cashiers when I mention xylitol. This one ingredient has enhanced my life as well as the lives of many others.

Xylitol was once only found in health food stores, however, it has become much more mainstream and is now readily available at retail outlets. This availability makes it much easier for patients to incorporate it into their daily schedule, and as a result, reap the multi-sided benefits.

What is Xylitol?

Xylitol, a naturally occurring sugar substitute, is clinically proven to be a natural enemy of bacteria. Xylitol is often referred to as wood or birch sugar because it was typically manufatured from birch trees. However, today xylitol is mainly extracted from corncobs. This is more practical considering the vast amount of xylitol that is being produced and consumed. Other natural sources of xylitol include plums, strawberries and raspberries.

Pure xylitol looks like sugar because it has a white crystalline appearance and it even tastes like sugar. However, it has 40 percent less calories than sugar. Only one-third of the absorbed xylitol gets metabolized in the body.

How does it work?

Over 400 strains of bacteria inhabit the human mouth. Sugar is one of the major energy sources for these bacteria and helps them proliferate.

When these sugars are consumed, acid is produced, creating a highly acidic environment in the oral cavity that demineralizes enamel and makes it vulnerable to attack by bacteria, leading to tooth decay.

Because xylitol is a five-carbon polyol, it is not metabolized by mouth bacteria, and as a result, no acids are produced in the mouth that can cause tooth decay.

The sweetness also stimulates saliva flow, which neutralizes any acids that have been formed and rinses away excess sugar residue. Xylitol helps keep an alkaline environment in the oral cavity that is inhospitable for mouth bacteria.

Thus, xylitol is both non-cariogenic in that it does not contribute to caries formation, and it is cariostatic because it prevents or reduces the incidence of new caries.

Xylitol actually reduces the amount of plaque and the number of Mutans streptococci (MS) in plaque.

How long has it been around?

German chemist Emil Fisher and French chemist M.G. Bertrand first discovered xylitol in the late 1800s. The first attempt at producing xylitol was in 1965.

Jessica Simpson says she only brushes three times a week (really!)

By Fred Michmershuizen, Online Editor

Some might call this “TMI” or “too much information,” but Jessica Simpson recently told Ellen DeGeneres that she only brushes her teeth three times a week because she doesn’t like her teeth to feel “slippery.” Simpson made her dental hygiene confession recently on DeGeneres’ television show.

Most dental professionals would assume that the blond bombshell, who some would say has a million-dollar smile, would take better care of her pearly whites.

Apparently, Simpson — who once wondered aloud on a television show whether a can of Chicken of the Sea tuna was tuna or chicken — falsely assumes that flossing every day, using mouthwash and occasionally wiping her teeth with a shirt are acceptable alternatives to brushing.

But a representative from the not-for-profit Delta Dental Plans Association, based in Oak Brook, Ill., says Simpson is in danger of losing her smile, and that any children who may be looking to her as a role model could be in for some pain if they choose to follow her ill-conceived oral hygiene practices.

“While flossing and using mouthwash are certainly good oral health practices, doing these things while neglecting daily brushing is like running around in the shower and calling yourself clean. Sure, you feel pretty good afterward, but chances are you missed some crucial spots,” said Chris Pyle, director of public relations for the Delta Dental Plans Association, a provider of dental insurance.

And that “slippery” feeling is actually a good thing, Pyle said.

According to Pyle, there’s a name for that coating Simpson said she needs to give her lips traction, and it’s called plaque — a naturally occurring coating of bacteria.

Flossing and mouthwash alone are not sufficient to remove all of the plaque that’s hiding on teeth, according to Pyle.

What’s worse, he said, Simpson’s hygienic transgression is not a victimless crime. Prospective love interests should know that harmful bacteria are transmissible through kissing.

“Sure, at the end of the day, a person thinking about kissing Jessica will need to weigh the risks with the reward. In this case, it still might be worth the risk but, come on, Jessica, brush twice a day and the possibilities are endless,” Pyle said.

Delta Dental is a national network of independent dental service corporations specializing in providing dental benefits programs to more than 54 million Americans in more than 95,000 employee groups throughout the country.

Delta Dental recommends that people brush their teeth at least twice a day with a fluoride toothpaste, floss every day and make annual visits to the dentist.
Dear Reader,

The dental profession in the United States is becoming more aware of the benefits of xylitol. At this point, dental publications, live educational courses and online courses are buzzing with the good news about xylitol, the amazing five-carbon natural sugar.

While dental professionals around the globe have been endorsing xylitol for many years, the United States has been slow to hop on the bandwagon. One of the reasons for this lag is the United States needed the right xylitol products to be available, and usage directions to be more clearly defined.

Now the products are here and the usage is simple: Use pure xylitol as a substitute sugar in place of ordinary toothpaste, mouth rinse, chewing gum, mints and can- dies. Following such a plan will ensure the recommended five exposures of xylitol daily are reached and increased oral health will result.

Dental hygienists are enthusiastically embracing the role xylitol can play in achieving dental health, but hygienists are not receiving the complete picture. The missing piece is where to find quality xylitol products.

As a profession, we send our patients to general supermarkets or drugstores to purchase recommended products, and for the most part patients are successful in locating products we have suggested. This is not true with xylitol.

While there are products containing xylitol sold at major retailers, they typically are not 100 percent sweetened with xylitol. This is an important detail to be aware of.

Products where xylitol is not listed as the first ingredient are not as effective as those listing xylitol first. This can mislead patients into thinking they are getting the benefits of xylitol by using the product when, in all actuality, they are not getting enough xylitol. So where can we send our patients to purchase high-content xylitol products?

The answer is: To health food stores! These stores carry 100 percent xylitol sweetened products. On the other side, each store knows which xylitol sold at major retailers, products we have suggested. This is where to find quality xylitol products, and for the most part patients are successful in locating xylitol products at local health food stores. These connections are being made by a team of hygienists’ hired by the company to operate as product educators.

Product educators visit dental offices on behalf of each store. These representatives drop off samples of xylitol products, offer education and inform the office of the nearest store offering 100 percent xylitol sweetened products. On the other side, each store knows which offices have been connected with their store and “Bridging the Gap” has been put into motion.

This is networking at its best! Hygienists are taking their career in a new direction, knowledge is being shared, referrals are going back and forth between dental offices and health food stores, more xylitol products are being purchased and used, and the bottom line is people are getting healthier. Isn’t this what our profession is all about?

If you would like more information regarding how to get your office involved in “Bridging the Gap,” contact Xlear National Sales Manager Chad Thomas at chad@xlear.com. In addition, as you’ve likely already noticed, this month’s article focuses on the many sides of xylitol.

Best Regards,

Angie Stone, RDH, BS

Dental Tribune America, LLC
213 West 55th Street, Suite 801
New York, NY 10019
Tel.: (212) 244-7181
Fax: (212) 244-7185

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Xylitol was a mixture with a syrup-like consistency. Xylitol was not manufactured in a crystalline form until World War II, when war-associated sugar shortages created the need to find alternative sweeteners.

Early on, xylitol was primarily used in diabetic diets and infusion therapy for burn and shock patients as well as for postoperative patients in Europe and Asia. It was when further study into xylitol’s biological properties, including dental, that large-scale production was needed.

Industrialized xylitol manufacturing began in Finland in the early 1970s in the form of gum and mints. It quickly became a daily part of Finnish life. Over the next 35 years, global awareness of the significant advantages xylitol offers continues, as does the variety of items that contain the substance.

How much do I need?
It was previously thought that the benefits of xylitol were dose related, not frequency related. However, researchers from the University of Washington did a series of studies in order to potentially substantiate these responses on Mutans streptococci’s prevalence and possible reductions with xylitol.

In one study, the efficacious dosage of xylitol was researched and the researchers concluded that MS levels were reduced with increasing doses of xylitol. The effect leveled off between 6.88 grams and 10.52 grams per day.1

In the second study, the participants consumed 10.32 grams per day (the higher leveling off amount from the previous study) of xylitol divided into two, three or four administrations per day.

After five weeks of use, there was no significant difference in MS levels in either plaque or unstimulated saliva in groups consuming xylitol two times per day.

However, significant differences were seen in the groups consuming 10.52 grams xylitol over three and four administrations per day. These results confirmed previous suggestions regarding xylitol dosage and frequency of consumption.

A dose range of 6 to 10 grams divided into at least three consumption periods per day is necessary for xylitol to be effective with chewing gum as the delivery system.2

Thus, the frequency is as important as the amount of xylitol used.

Where do I find it?
Many products in local grocery stores contain xylitol. The easiest to find are gum and candy, but check the ingredients. Just because one flavor or type contains xylitol does not mean that all types of gum from that manufacturer will contain it.

Health food stores will carry a larger selection of products, such as mouthwash, toothpaste, mints, individual packets to use in coffee/tea, bulk packaging to use in cooking, nasal sprays and neti pots.

Search the Internet for brands and then ask your local pharmacy, grocery or health food store to stock the product. Many items may also be ordered directly from the manufacturer.

Are there any disadvantages?
Xylitol was approved by the U.S. Food and Drug Administration (FDA) in 1963, and it has no known toxic levels or serious known side effects for humans; up to 40 grams per day have been noted with little more than a mild laxative effect.

Nonetheless, it should be mentioned that it may be dangerous if consumed by pets, such as dogs and cats.

Conclusion
Prof. Jason Tanzer summed things up best: “Xylitol is inhibitory to the metabolism, growth and plaque formation by Mutans streptococci ... xylitol is conducive to remineralization of initial carious lesions ... I have full confidence that these data distinguish xylitol from any other sugar substitute.”

Xylitol is a low-glycemic sweetener and is metabolized independently of insulin. Xylitol does not cause the sharp increase in blood sugar levels or the associated serum insulin response, which is usually seen following consumption of other carbohydrates.

Because of this and the dental and medical benefits it provides, xylitol can be recommended as a sugar-free sweetener suitable for diabetics as well as for the general population seeking a healthier lifestyle.

References
2. Ly K, Milgrom P, Roberts M, Yamaguchi D, Rothen M and Mueller G. Linear response of serum insulin response, which is usually seen following consumption of other carbohydrates.

About the author
Sandra Berger graduated from Ohio State with her RDH and a BS in education. She is the New Jersey clinical specialist for Oral DNA Labs, a salivary diagnostic company.

Berger is currently vice president and C.E. chair of NJDHA. She is a recipient of the Sunstar RDH Award of Distinction 2007, member of AmyRDH Listers and Career Fusion Alumni 2009 and 2010.