

DENTAL CARE

Fermentation of Sugars

Sugars are an important part of the human diet. They are a major source of energy for the body. Once sugars are put into the mouth, the digestive processes begin with the breakdown of sugars by the enzyme amylase contained in saliva.

Bacteria that live in our mouth, likewise, need a source of energy and also thrive on sugars. One such bacterium, *Streptococcus mutans*, is well known for its ability to ferment sugar (sucrose) into lactic acid which is capable of destroying the enamel of teeth causing dental decay (cavities).

The mouth is a hostile environment in which *S. mutans* must live. It has to survive the grinding and gnashing of teeth, a river of saliva washing through the mouth, brushings and flossings by the human host and periodic power-washings, scrapings and cleaning with sharp tools carried out by the dental hygienist.

To protect itself, *S. mutans* and other bacterial species generate a thick protein secretion to cover themselves known as dental plaque. This coating which contains a community of trillions of microbes accumulates rapidly on the teeth and at the junction between the teeth and the gums. It is readily visible to the naked eye and is the source of generous amounts of lactic acid, the destroyer of teeth.

Lactic Acid and Tooth Decay

Although enamel, the outer layer of the tooth, is the hardest substance in the human body, it succumbs to constant bathing in lactic acid. The mouth usually maintains an acid/alkali concentration close to neutral (pH 7), neither acid or alkaline. Once the pH goes below 5.5, the enamel becomes susceptible to destruction and decay. The lower the pH and the longer the pH stays below 5.5, the more quickly cavities develop.

Each time you eat a fermentable carbohydrate (cookies, candies, pies, cakes, gum drops, ice cream, soda pop etc.,) the microbes in your mouth metabolize the sugar and produce acids which drops the pH around the tooth from its normal neutral pH of 7 down to as low as 3.5.— more than 1000 times more acidic than normal. The oral cavity pH remains low for about 20 minutes after each exposure to sugar.

Recommendations:

- Reduce the amount of refined sugars in your diet.
- Ideally, brush and floss your teeth after meals and at bedtime.
- Use a toothpaste that will neutralize acid (i.e. contains baking soda), helps destroy microbes (e.g. peroxide) and protects against decay (e.g. fluoride). Examples include, Colgate or Crest Baking Soda and Peroxide with Fluoride.
- If brushing and flossing after meals is not convenient/or easily accessible, finish eating by drinking an 8-12 ounce glass of water that will help rinse sugar out of your mouth and reduce the concentration of microbes in the mouth.
- Do not eat sugar containing foods for several hours before going to sleep.
- Make an appointment to see your dental hygienist at 3-6 month intervals for cleanings.

ADDENDUM:

Avoid bathing your mouth in fluids that are highly acidic. Examples: Coca Cola® and Pepsi Cola® (pH 2.5) and orange juice (pH 3.0).

They increase the risk of developing dental decay enormously.

Eleven dentist approved measures for oral home health care

1. **Brush long enough:** The American Dental Association recommends brushing a minimum of two minutes each time to remove dental plaque. For those who have devices in their mouth, like braces, a bridge, or implants, add extra time to clean around areas where food may get trapped on the device.
2. **Brush often enough:** Ideally, teeth should be brushed after each meal and before bedtime to remove bacteria and plaque. At a minimum they should be brushed twice daily.
3. **Brush the right way:** After placing the toothbrush in the mouth, tilt the toothbrush up so that it's at a 45° angle to the gums. Move the brush head from tooth to tooth using a small circular motion. This goes for the outer surfaces of teeth, the inner surfaces of teeth, and the tops or chewing surfaces of teeth.
4. **Use the right kind of toothbrush:** Most dental professionals will agree that a rotating, oscillating, electronic toothbrush or sonic driven toothbrush is better at removing plaque from the teeth than a manual bristle toothbrush. Oscillating toothbrushes may rotate at up to 8800 strokes per minute. Sonic toothbrushes may vibrate at up to 40,000 strokes per minute. A popular brand name oscillating toothbrush is marketed under the brand name of Oral-B®. A popular sonic toothbrush is marketed under the name of Sonicare.®
5. **Floss after meals and at bedtime:** Flossing is important. Failure to floss results in missing half the surfaces of the teeth where plaque can form causing cavities and gum disease.

6. **Brush the tongue:** The tongue forms the floor of the mouth. It is critical for speech and swallowing. It can, however, act as a trap for bacteria causing bad breath, dental decay, and gum disease. Use the toothbrush to gently brush back and forth several times with each brushing. Special tongue brushes may be purchased on the Internet that cost only a few dollars
7. **Don't brush too hard:** Whether using a manual or a powered toothbrush, the most effective way to clean the teeth is by repetition, not force. Exert the same amount of pressure as the amount one might use to ring a doorbell. Too much pressure may wear down the enamel surface and cause the gums to shrink and recede from the teeth forming pockets at the base of the teeth in which microbes can hide.
8. **Don't use too much toothpaste:** Adults need only to express a pea-sized amount of toothpaste on the brush, or one half the length of the standard toothbrush.
9. **Store the toothbrush properly:** Keep the toothbrush as clean as possible. Rinse thoroughly after using it to make sure toothpaste and any debris is removed from the bristles. Store the brush in the upright position where it can air dry. If stored with other toothbrushes, make sure they do not come in contact with each other. Don't store the toothbrush in a closed container since microorganisms that grow best in warm, dark, and moist environments may proliferate on the brush.
10. **Change the toothbrush or the toothbrush tip on an electronic powered toothbrush frequently.** The lifespan of a manual bristle toothbrush is about 3 to 4 months. After that, the bristles become frayed and do not clean the teeth well. Replace the brush. For powered toothbrushes change the toothbrush tip every 90 days.

11. **Prevent dry mouth.** Saliva provides a major source of defense for the oral cavity against dental infections, gum disease, and dental decay. Conditions that can lead to a decrease in the formation of saliva in the mouth include drugs, radiation treatments, diseases like Sjogren's syndrome, and failure to hydrate. Drinking water ensures optimal salivary flow. The water of choice should be distilled water.