



What is Plaque?

Many readers may already be aware that oral plaque is one of the leading causes of tooth decay, but what plaque is and how it actually breaks down your tooth enamel is often less clear. Plaque is an organized colony of multiple forms of bacteria that live in your mouth all the time. You can never completely disinfect or eliminate these bacteria from your body, but you can keep them from destroying your teeth.

How Does Plaque Hurt Your Teeth?

It's easy to assume that plaque bacteria eat tooth enamel and that's how you get cavities, but that is simply not true. Plaque bacteria eat the same foods that we do, and they thrive specifically on highly refined carbohydrates, sugar, and acid. These foods allow the bacteria to reproduce and organize into a plaque colony very quickly. One of the side effects of this process is the release of acid. It is this acid that destroys the teeth and creates cavities, not the bacteria itself.

If you've ever felt the sensation of "fuzzy" teeth after eating a very sugary snack, what you are feeling is the rapidly multiplying colony of plaque growing on your teeth. Ever gone a step further and gently removed some of that fuzz close to the gumline with your fingernail? The white sticky material under your fingernail is the plaque colony itself. If you put it under a powerful enough microscope, you would see a thriving colony of living microorganisms.

Most of us don't have access to the microscopes necessary to really see how a plaque colony is formed. Fortunately, we don't have to because scientists have observed and recorded the process for us. The video presented here (<http://www.youtube.com/watch?v=q26YhisTg7U>) shows an experiment conducted by Wenyan Shi of UCLA. A totally clean, hydroxyl apatite surface was pulsed with human saliva over a 24-hour period and filmed through a microscope.



How Does Plaque Hurt Your Teeth? (cont'd)

Human saliva always contains plaque bacteria. When this bacteria has access to food and is left undisturbed by a toothbrush or floss, it will multiply. The final 8 hours of Dr. Shi's experiment have been excerpted into this 2-minute time-lapse. This is how quickly large, organized colonies of plaque can grow in the mouth when left undisturbed. This same process happens in your mouth every time you eat sugary, highly acidic foods and do not brush or floss your teeth for 24 hours or longer.

What Allows Plaque to Thrive?

Plaque is made up of some remarkably clever and resilient bacteria. It is impossible to completely remove or disinfect this bacteria from your mouth. The best we can do is control their growth by denying them the foods they love most and disturbing the formation of plaque colonies regularly with brushing and flossing. Plaque bacteria especially like to live in the dark, warm corners between the teeth and near the gumline. Even if you eat a very healthy diet, you brush and floss regularly, and you've never had a cavity, chances are that these bacteria are living somewhere in your mouth just waiting for the environment to change so that they can reproduce.

But what can change in a person's life to allow previously controlled bacterial plaque to thrive? Dietary changes are certainly the most common cause, and an increase in sugar and acid are at the top of the list. In fact, any food or beverage made with highly refined carbohydrates, added sugar, or concentrated acids has the potential to offer plaque bacteria a comfortable environment and an easy meal. Here are just a few of the worst dietary offenders in promoting bacterial growth in the mouth.



Foods That Feed Plaque

- Cookies, cakes, muffins, scones, donuts and any other baked treats
- All types of candy, with extremely sour gummy candies being the worst
- Most types of pasta and cereal
- All types of soda, energy drinks, and sports beverages, even diet beverages
- Fruit juice, dried fruit, and fruit leather

Why Diet and “Health” Foods Can Be Bad For Your Teeth

Diet sodas and other sugar-free beverages are often extremely acidic. The acid itself in these drinks can destroy the teeth over time, but that acid also does something else – it makes the pH in your mouth more acidic overall. Plaque bacteria love an acidic environment. In fact, in a neutral or basic environment, these bacteria will not feed as well even when refined sugar is present. In an acidic environment, however, bacterial plaque can make the most of every refined carbohydrate you put in your mouth. Remember that the next time you consider ordering a diet soda with a pasta salad and try water instead.

So-called health foods can also be a huge trigger for bacterial growth in the mouth. Dried fruit, fruit leathers, and fruit juices are all popular alternatives to candy, cookies, and soda for kids and adults, but regular consumption of these foods can have disastrous effects on the teeth. The process of drying fruit or juicing it concentrates the natural sugar and acid. What makes dried fruit so much worse than a piece of chocolate or even a cookie is the fact that dried fruit will stick to your teeth. If you don't brush and floss your teeth for several hours afterwards, the bacteria will continue to feed on that little piece of fruit leather stuck between your teeth until you do. If you eat dried fruit or fruit leather every day, you can begin to understand how a cavity or group of cavities could develop very quickly. A serving of fresh fruit without any added sugar is always a better alternative to dried fruit or juice.



Why Saliva Matters

Diet isn't the only contributing factor to bacterial growth in the mouth. Stress, chronic illness, certain medications, hormonal fluctuations during monthly cycles, pregnancy, menopause, and even some physical activities can promote an environment in the mouth where bacterial plaque is more likely to grow. Of these, conditions that promote a dry mouth seem to be the most destructive.

Saliva is a wonderfully protective force in the mouth. Even though it contains plaque bacteria, it also contains healthy bacteria. When the pH of your mouth is in balance, the healthy bacteria outnumber the plaque bacteria and your saliva acts as a protective barrier over the teeth that can help inhibit plaque reproduction. A chronically dry mouth disrupts this naturally protective process, inhibits good bacterial growth, and promotes an acidic environment. Many types of medication have dry-mouth side effects. Endurance athletes, like long-distance runners and bikers, also tend to have regular periods of dry mouth throughout the week. These people can still control their risk of decay through diet and home care, but will automatically need to be more careful because one of the protective forces in the mouth is already compromised.

The Mouth-Body Connection

The more we learn about all the different types of bacteria that live in the mouth and body, the more we are beginning to see the connections between dental health and the health of the entire body. Several species of periodontal bacteria have been found in the atherosclerotic plaque of heart disease patients. The relationship between periodontal bacteria and atherosclerotic plaque is not yet clear, but we do know that brushing and flossing will help control those bacteria. If these plaque are entering the bloodstream through the mouth, theoretically controlling gum disease would be an important first step in controlling heart disease. Some long-term studies are even suggesting a potential relationship between dental



The Mouth-Body Connection (cont'd)

plaque and cancer mortality. Controlling pathogenic oral bacterial growth appears to be more important for whole-body health than ever before.

For most of us, controlling plaque growth in the mouth is as simple as eating a healthy diet and brushing and flossing your teeth correctly at least twice a day. Regular checkups with your dentist will also help you discover and control additional risk-factors that may be present due to chronic conditions or other health and lifestyle factors, allowing you keep your teeth and your body as healthy as you can for the rest of your life.

References:

British Medical Journal: *[The Association of Dental Plaque with Cancer Mortality in Sweden; A Longitudinal Study](#)*

TIME Healthland: *[Got Plaque? It Could Boost Your Risk of Early Cancer Death](#)*

Harvard Medical School: *[Heart Disease and Oral Health – The Role of Oral Bacteria in Heart Plaque](#)*