

Cavities: It all comes down to basic chemistry

One of the first things I ever learned from Mr. Johnson, my high school chemistry teacher was the difference between an acid and a base. He explained how acids and bases were measured on the pH scale (0-14). Strong acids were 0-3, water was neutral at 7, and bases were in the 11-14 range. Additionally, acids were described as tasting sour and strong enough to corrode metals, where bases tasted bitter and had a soapy or slimy feel.

If strong acids are able to corrode metals, it is safe to assume that acids can also dissolve teeth. In fact, a cavity is exactly that. Acid in our mouth is able to bind with the calcium and phosphate in our teeth and demineralize certain parts of our teeth. These demineralized areas are called cavities and a cavitation starts to form in teeth as soon as the pH level in our mouth drops under 5.5.

Now, many of you are wondering how acid gets into your mouth. I think you will be surprised how many things we consume are not only acidic, but are extremely strong acids. Here are three main ways acids enter our mouths.

- 1) We eat. The bacteria in our mouth are able to break down carbohydrates into lactic acid. Lactic acid has a pH of 3.8 and this level can demineralize teeth. Even certain foods are very acidic; for example, raisins have a pH of 3.98, vinegar has a pH of 3, and lemons have a pH of 2.
- 2) We drink soda, juices, sports drinks and energy drinks. Look at the following list of drinks and their pH's. Orange Juice- 3.8, Apple Juice-3.58, Red Bull- 3.32, Gatorade-2.95, Powerade- 2.78, and Cola-2.61. Even though diet sodas have artificial sweeteners, it still has a pH of 2.8. So even sugarless drinks can cause decay in our teeth! It all comes down to the acidity of the drink.
- 3) Stomach acid has a pH of anywhere between 1 and 2. It is an extremely destructive form of acid. In people with acid reflux or heartburn, this acid rises up their esophagus and enters their mouth. This is one of the most potent forms of acid and can create a rampant amount of decay and erosion. So it is extremely important to have your doctor treat you for acid reflux if you have heart burn on a regular basis.

The other thing that we have to consider is not just the strength of the acid but also the length of time the pH level is under 5.5. So imagine a food like Swedish Fish or Sour Patch Kids. Those candies are loaded with sugar plus they are sticky. The candy sticks to your teeth and stays in your mouth. This allows the pH in your mouth to stay under the magic 5.5 number for a longer time period.

So how do we avoid getting cavities? Let's look at the three main ways acid gets into our mouths again and limit them.

- 1) Eating food- it is something everyone has to do to survive, so we cannot eliminate eating. However, we can limit the amount of sugary and sticky foods that we consume; or, we can brush and floss extremely well and eliminate all the extra food that we leave in our mouths. If brushing or flossing is not readily available, we can also rinse with water or chew a sugarless piece of gum. The sugarless gum stimulates saliva production and helps to rinse food off of your teeth.
- 2) Acidic Drinks- drinking more water is one alternative. It also has zero calories. Most of the sodas we drink are loaded with calories and one can of regular soda has the equivalent of 11 teaspoons of sugar in it. Another alternative is limiting the amount of time the liquid contacts your teeth. Using a straw helps with this.
- 3) Acid Reflux- If you have acid reflux, it is important to be taking your medication regularly, not just when you have episodes of heart burn. Most medications are designed to prevent heartburn before it starts.

There are also some things that we do at the dental office to prevent cavities from forming.

- 1) Prophy Jet (Baking Soda Spray)- At the end of every cleaning at our office, we spray baking soda on your teeth. The baking soda has a pH of 9. So it can help raise the pH levels of your mouth and neutralize the acid.
- 2) Fluoride Treatments- Sodium Fluoride is the primary type of fluoride found in toothpastes. It is mildly basic, so it can help raise the pH levels in your mouth. The fluoride can also inhibit the bacteria in your mouth from breaking down the carbohydrates into acid; eliminating the amount of lactic acid produced. Lastly, fluoride also binds with the calcium and phosphate in your teeth and makes the teeth harder; therefore, more resistant to acid demineralization. In addition to fluoride treatments at the dental office, you can get fluoride naturally by drinking tap water in most of Orange County and you can find it in almost every type of toothpaste.

Hopefully, this newsletter gives you ideas on how to reduce acid exposure in the future.

Lastly, we are almost done with our renovation of the office. We thank you for your patience as we transitioned between offices and we hope that you are happy with the new additions. We look forward to seeing you soon! As always, feel free to email or call us with any questions you may have. Also, look for us on Facebook at www.facebook.com/forddentalgroup. We are always posting new links and interesting dental articles for your information.

With your dental health in mind,