

# Tooth Decay

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Dental caries (tooth decay) involves three major factors:

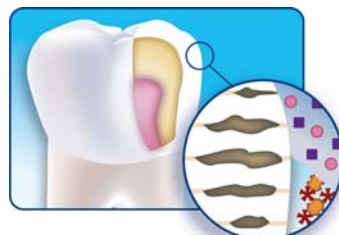
- Food or beverages consumed
- Bacteria in plaque
- Your teeth and mouth

When these factors get tipped in favor of the bacteria, the waste products they produce from food, in the form of acids, cause a breakdown or demineralization of areas underneath the tooth surface.

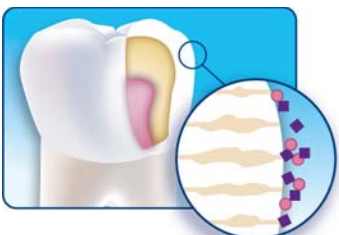
The simplest way to think of this is each time you eat there is an acid attack on the tooth. A counter-attack by your body occurs by rinsing the food and acid away with saliva (Figure 1). The saliva buffers or neutralizes the acids, but more importantly it contains minerals (calcium and phosphate) that rebuild the areas of the tooth that were demineralized or attacked by the acids. This rebuilding process is known as remineralization.



Acid and food particles "attack" the enamel causing it to weaken.



Saliva washes away the acid and food particles while introducing minerals.



The minerals from the saliva help rebuild tooth enamel.

Figure 1.

This series of attacks and rebuilding is like a "tug-of-war" in your mouth (Figure 2). Again, the factors involved are:

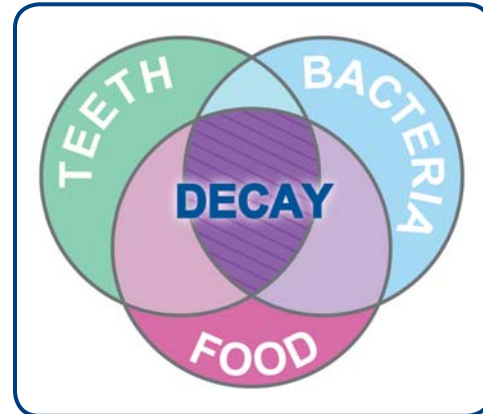


Figure 2.

By fully understanding the cause of dental caries and by looking at each of the three factors, we can look at ways of preventing this transmissible disease.

## FOOD AND BEVERAGES CONSUMED

Foods and beverages that are consumed for prolonged periods of time between meals can tip the balance of remineralization/demineralization in favor of the decay process. Sticky foods such as caramels and raisins should not be eaten as between meal snacks because the acid attack becomes too much for the saliva to prevent and repair. The same foods eaten only at mealtimes allows for the tug-of-war to be a winning situation for the person and their teeth.

If children are allowed to fall asleep with a baby bottle or given the bottle to carry around with them and the liquid (this includes milk, fruit juices, and other drinks) can be used by the bacteria to produce acids, tooth decay can rapidly occur. This is often known as "baby-bottle tooth decay" and an example is shown in Figure 3.

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Figure 3.

Help prevent tooth decay by:

- Limit eating sticky foods with sugar in between meals
- Limit sipping sweetened beverages and fruit juices between meals

**BACTERIA IN PLAQUE**

The plaque bacteria on your teeth should be removed by brushing at least twice a day and flossing once a day. Usually a clean tooth can stay healthy. Certain bacteria are more likely to cause decay because they can use the sugars and starches you eat better than others. Bacteria called *streptococci mutans* and *lactobacillus* are two types of these culprits. We all have small amounts of these types of bacteria, but sometimes they may be present in higher levels. In those situations, you would be at higher risk or more likely to lose the tug-of-war. Your dental team may use a sample of your saliva to measure levels of these bacteria.

Bacteria are also responsible, in part, for bad breath. The bacteria in plaque process food particles and produce waste products, some of which are foul smelling sulfur compounds. One of the components of plaque is bacteria. As plaque builds up on teeth, it makes them look dirty and dingy (Figure 4).



Figure 4.

**YOUR TEETH AND MOUTH**

The third main part of the tooth decay situation is your teeth and mouth. This includes everything from the way the teeth are shaped, formed and positioned, to your saliva, dental treatment, and oral health habits. Your saliva is very important in many ways including slowing the loss of mineral from the teeth and replacing it in the remineralization process. Sometimes certain conditions or medicines change the amount and type of saliva and the tooth decay process can continue all the way to cavities.

The deep grooves and pits in some teeth, such as molars, can be trouble spots for decay. One way to prevent this type of decay is to have your dental team paint a shaded plastic material called a pit and fissure sealant on these areas (Figure 5). Once the sealant hardens it acts as a barrier protecting the tooth surface from plaque and acids.



Figure 5.

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Fluorides also play a significant role in preventing decay:

- **Systemic Fluoride helps strengthen teeth while they are forming**
  - Regulated fluoride in the water supply provides optimal levels
  - Fluoride supplements may be prescribed in areas where water fluoridation is not available
- **Topical Fluoride helps strengthen teeth after they have erupted**
  - Professionally applied or prescribed topical fluoride treatments such as fluoride foams, gels, rinses and varnishes are available
  - Over-the-counter fluoride sources are available in the form of rinses, gels, and toothpaste

One of the best ways to prevent mineral loss from the tooth or demineralization and help the replacement process or remineralization is by using toothpaste that contains fluoride. A small amount used daily helps balance the “tug-of-war” situation in your favor. Many scientific studies over a long period of time have proven this to be one of the most effective ways to prevent tooth decay. Brand new advances in toothpaste technology have made this even better by including antibacterial components such as the tin in stannous fluoride.

## CONCLUSION

Tooth decay is a process that involves a balance of the mineral loss and replacement over time in response to the daily acid attacks resulting from foods. Cavities and the decay process can be prevented by working closely with your oral health team and following their plan for you. Eating the proper foods at the right time during meals and avoiding foods or snacks between meals can help reduce your risk. Brushing your teeth with a toothpaste with fluoride (ADA Accepted\*) at least twice a day is a critical step toward balancing the “tug-of-war” on your tooth surfaces and preventing the tooth decay process from continuing to become cavities.



\*The ADA Council on Scientific Affairs' Acceptance of Crest Pro-Health Toothpaste is based on its finding that the product is effective in helping to prevent and reduce tooth decay, gingivitis and plaque above the gumline, to relieve sensitivity in otherwise normal teeth, and to whiten teeth by removing surface stains, when used as directed.

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