CONDITION

Tooth decay

Tooth decay is damage to a tooth caused by acids made by plaque bacteria.

WHAT IT IS
Gradual acid damage to tooth structure

BODY SYSTEM
Teeth and mouth

MAIN SYMPTOMS
Often none early, sensitivity, toothache, visible holes

WHAT CAUSES IT
Plaque bacteria, frequent sugars, and acid damage

HOW IT IS DIAGNOSED
Dental examination, sometimes X-rays

MAIN TREATMENT
Fluoride, fillings, and restorative dental care

CAN IT BE CURED?
Sometimes - early enamel damage can reverse

IS IT AN EMERGENCY?
Sometimes - when swelling affects breathing or swallowing

LONG-TERM OUTLOOK
Usually manageable, but repaired teeth need lifelong care

Overview

Tooth decay is damage to the hard parts of a tooth. It is also called dental caries or a cavity.

Your mouth contains bacteria that form a sticky layer called plaque. When you eat or drink sugars and other fermentable carbohydrates, some plaque bacteria turn them into acids. These acids remove minerals from the tooth's outer surface, called enamel.

Saliva and fluoride can help replace lost minerals. However, repeated acid attacks can eventually break down the enamel and form a hole. This is a cavity. Once tooth structure has been lost, it does not grow back and usually needs dental treatment.

Decay can move through enamel into dentine, the softer layer underneath. If it reaches the pulp at the centre of the tooth, it may inflame or infect the nerves and blood vessels there.

Early decay may cause no symptoms. Finding it at this stage can allow treatment before a

filling is needed. Untreated decay may lead to pain, infection, difficulty eating, or loss of the tooth.

Symptoms

Early tooth decay is often painless. A dentist may see a chalky white area where enamel is losing minerals, especially near the gumline or around braces. Dark marks do not always mean active decay, so appearance alone cannot confirm it.

As decay progresses, you may notice:

Sensitivity may be brief at first. Pain that continues after the trigger is removed can mean that the deeper tooth tissues are irritated.

An infected tooth may cause severe throbbing pain, gum swelling, pus, a bad taste, or swelling of the face or jaw. Fever or feeling unwell can occur if an infection is spreading.

Children may not describe dental pain clearly. They may avoid chewing on one side, refuse certain foods, sleep poorly, or become unusually upset during meals.

- Sensitivity to cold, hot, sweet, or acidic foods and drinks
- Toothache or pain when biting
- A visible hole, rough area, or broken edge
- White, brown, or black marks on a tooth
- Food repeatedly catching between particular teeth
- Bad breath or an unpleasant taste

Causes and risk factors

Tooth decay develops when a tooth is repeatedly exposed to acids made by plaque bacteria. The balance between mineral loss and repair is affected by diet, saliva, fluoride, tooth shape, and oral hygiene.

The frequency of sugar exposure matters. Regularly sipping sugary drinks or frequently snacking on sweet foods gives bacteria repeated chances to make acid. Sugar may also be present in sweetened medicines, sports drinks, flavoured milk, and some processed foods.

Risk is higher when plaque remains on teeth for long periods. Crowded teeth, braces, bridges, dentures, and deep grooves in back teeth can make some areas harder to clean.

A dry mouth also raises risk because saliva helps neutralise acid and wash away food. Dry

mouth may be linked to medicines, radiation treatment to the head or neck, dehydration, or conditions affecting saliva production.

Gums can recede with age or gum problems, exposing the tooth roots. Roots have less protective enamel and can decay more easily.

Babies and young children can develop decay if teeth are often exposed to sugary drinks, including during sleep. Anyone can develop tooth decay, including people who brush regularly.

Diagnosis

A dentist diagnoses tooth decay by asking about symptoms and examining your teeth. They look for changes in colour, texture, or shape and may check whether a suspicious area is soft or damaged.

Dental X-rays may be used to find decay that cannot be seen directly, particularly between teeth or beneath an existing filling. An X-ray can also help show how close decay is to the tooth's pulp. Not every visit or suspected early area requires an X-ray.

Some dental practices use light-based devices or photographs to monitor possible early decay. These can support the examination, but they do not replace professional assessment.

The dentist will also look for factors that may allow decay to continue, such as dry mouth, frequent sugar intake, exposed roots, or difficulty cleaning around dental work. This helps guide prevention and follow-up.

Treatment and management

Treatment depends on whether the tooth surface is still intact, how deeply the decay extends, and whether the pulp is affected.

Very early enamel decay may be stopped or partly reversed through remineralisation. This means minerals are returned to the weakened enamel. Management may include fluoride treatment, improved plaque removal, changes to the frequency of sugary foods and drinks, and dental monitoring.

Once a cavity has formed, lost tooth structure cannot be restored by brushing or fluoride alone. A dentist usually removes or seals off the damaged area and repairs the tooth. Treatment may include:

Some early or limited areas can be managed with techniques that seal or stabilise the decay rather than removing a large amount of tooth. The suitable approach depends on the tooth and

the extent of damage.

Local anaesthetic can numb the area during many procedures. If dental treatment causes significant anxiety, tell the dental team before the appointment so available support can be discussed.

Antibiotics like amoxicillin or doxycycline do not repair a cavity or remove the source inside an infected tooth. They may be used when there are signs that an infection is spreading, alongside dental treatment.

- A filling for a smaller cavity
- A crown or other restoration when more of the tooth is weakened
- Root canal treatment if the pulp is badly inflamed or infected
- Removal of the tooth when it cannot be repaired predictably

Complications

Untreated decay can weaken a tooth until part of it breaks. It may then require a larger restoration, root canal treatment, or removal.

When bacteria reach the pulp, they can cause inflammation or infection. An abscess is a collection of pus around a tooth or in the nearby gum and bone. It may cause severe pain, swelling, a bad taste, or tenderness when biting.

Infection can sometimes spread into the face, jaw, or neck. This is uncommon but needs urgent care, especially if swelling affects swallowing, breathing, or the area around an eye.

Ongoing pain can interfere with eating, sleeping, school, work, and concentration. A painful tooth may also lead you to chew differently, which can limit the foods you eat.

Losing a tooth may allow nearby teeth to move and can affect chewing. Replacement options exist, but preserving a repairable natural tooth is often simpler than replacing it.

Prevention

Many cases of tooth decay can be prevented, although no method removes all risk.

Brush all tooth surfaces thoroughly twice a day with fluoride toothpaste. Fluoride strengthens enamel and helps repair early mineral loss. After brushing, spit out the toothpaste rather than immediately washing it away with water.

Clean between teeth regularly using floss or another interdental cleaner that suits the spaces.

A dentist or dental hygienist can demonstrate how to clean around braces, bridges, implants, or dentures.

Try to limit how often teeth are exposed to sugar. Having sugary foods or drinks with meals is generally less harmful than repeatedly snacking or sipping them over several hours. Water and unsweetened drinks avoid repeated sugar exposure.

Regular dental visits allow early changes to be monitored. The timing of check-ups should reflect your current risk rather than following one schedule for everyone.

Fluoride varnish and protective sealants may be recommended, especially for children or people at higher risk. If you have persistent dry mouth, a dentist or healthcare professional can help look for the cause and suggest ways to protect your teeth. Do not stop a prescribed medicine without advice.

Living with it and what to expect

Early decay can remain stable or improve when the enamel surface is intact and the causes are addressed. Follow-up may involve photographs, X-rays when appropriate, or comparison with previous examinations.

A cavity will not close by itself. After it is repaired, the tooth can usually be used normally, although it still needs daily care. Fillings, crowns, and other restorations may wear, chip, or develop decay around their edges over time. They may eventually need repair or replacement.

A tooth that has had root canal treatment no longer has living pulp, but it still needs cleaning and dental review. It can develop decay or fracture like another tooth.

Your future risk is influenced by sugar exposure, fluoride use, saliva, cleaning, and access to dental care. Some people need closer monitoring because of dry mouth, exposed roots, previous frequent cavities, or difficulty cleaning their teeth.

Most people can continue eating, working, exercising, and carrying out their usual activities during routine care. Prompt treatment often means a smaller procedure and helps preserve more of the natural tooth.

When to get medical help

Arrange a routine dental appointment if you notice new sensitivity, a mark or rough area that does not go away, food repeatedly catching, or a lost or damaged filling. Early decay may not hurt, so pain is not required before seeking assessment.

Ask for an urgent dental appointment if you have:

Seek emergency medical care if facial or neck swelling makes it hard to breathe or swallow, is rapidly increasing, or is spreading toward an eye. Contact local emergency services rather than waiting for a routine dental visit.

Painkillers may provide temporary relief, but they do not treat the decay or remove an abscess. Follow the product label and ask a pharmacist or healthcare professional if you are unsure what is safe for you.

- Severe or persistent toothache
- Swelling of the gum, face, or jaw
- Pus, a bad taste, or a suspected dental abscess
- Fever or feeling unwell with dental pain
- A broken tooth causing pain or a sharp exposed area

Common questions

Can tooth decay heal itself?

Very early decay may be stopped or partly reversed while the enamel surface is still intact. Fluoride, saliva, plaque removal, and fewer sugar exposures support this repair. A physical hole cannot grow back and usually needs dental treatment.

What does early tooth decay look like?

It may appear as a chalky white, brown, or dark area, but it can also be hidden between teeth. Stains and harmless enamel changes can look similar. A dental examination is needed to tell the difference.

Why does my tooth hurt when I eat something sweet or cold?

Decay may expose dentine, which contains tiny channels leading toward the nerve. Cold, sweetness, or acidity can then trigger sensitivity. Cracks, worn enamel, gum recession, and damaged fillings can cause similar symptoms.

Can tooth decay spread from one tooth to another?

A cavity does not directly spread like a rash. However, the same plaque, eating pattern, dry mouth, or cleaning difficulty can affect several teeth at once. Plaque bacteria can also pass between people through saliva, but bacteria alone do not guarantee decay.

Does a filling cure tooth decay?

A filling repairs the damaged area and helps restore the tooth's shape and function. It does not

remove the conditions that allowed decay to develop. New decay can form elsewhere or around a filling's edge, so preventive care remains important.

Will tooth decay always cause pain?

No. Decay may progress without pain, especially in its early stages. Pain often begins when damage reaches deeper dentine or the pulp, which is why regular dental examinations can find problems sooner.

Sources

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