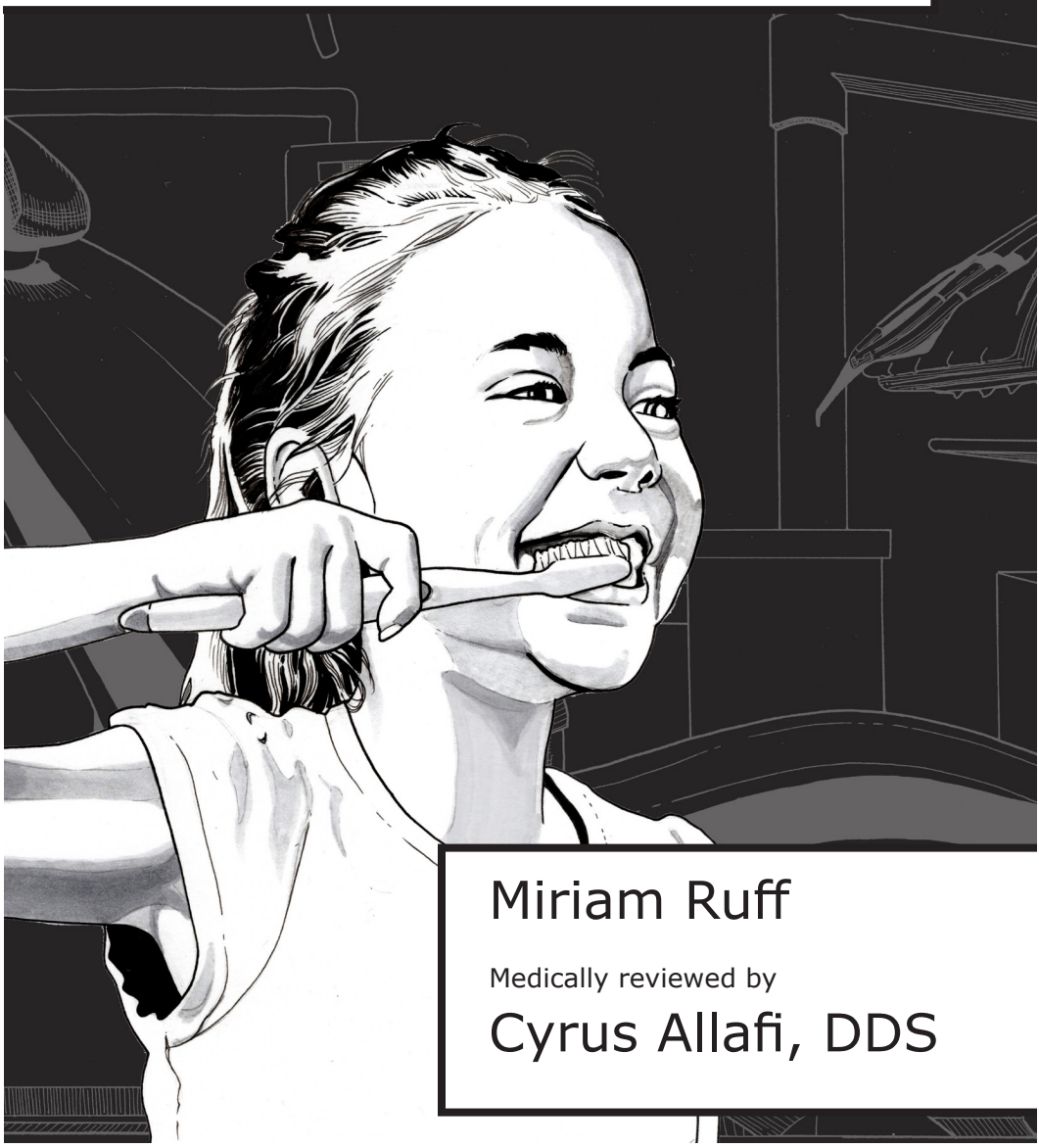
Sinking Your Teeth into Proper Dental Care

Second Edition



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INTRODUCTION

When this book was originally published, it was a relatively comprehensive look at dentistry at the time. Advances in technology and technique, though, have changed the dental field considerably since then. As a result, it seemed a good idea to revisit the content at this time. So much has changed that the updates and amount of new information has more than doubled the page count of the previous version.

Patients are an essential part of the dental team, so it's important to be as up-to-date about your teeth and gums as possible to make informed choices about your treatment. From abscesses to xerostomia, from teeth whitening to root canals, you can find the information you need within these pages, all at no cost.

We wish you the best dental health and a dazzling smile to match.

Miriam Ruff
April 2024

WHAT'S IN A SOUND?

The sound of a dentist's drill — or even the thought of the pain it implies — is enough to make grown men run in the opposite direction. As a result, most people avoid thinking about the health of their teeth until it's too late. The good news is you can prevent dental problems before they start with simple, routine care. And with early detection, it's easier for your dentist to successfully treat many conditions. So, where do you start?

WHAT ARE TEETH?

Before discussing specific conditions or treatments, it's important to know a little about how the teeth are formed and their basic structure.

Tooth Development

In humans, teeth develop as early as the sixth week of pregnancy. Calcification (the addition of calcium, which helps give teeth their strength) follows at about the 14th week. And at birth, the primary teeth are almost completely formed.

Because of their early development, an expectant mother's nutrition and health can impact proper tooth formation, even in the initial stages of her pregnancy. For example, pregnant women deficient in vitamins A, C, or D, or those with low blood levels of calcium and phosphorus, often have children born with tooth defects. In addition, women who are malnourished tend to deliver babies with low birth weight. These children are more susceptible to dental caries (cavities) as they grow older than children born to well-nourished mothers.

The primary teeth begin to erupt when the child is about six months old, and the process continues for approximately two years. These teeth are eventually replaced by the "adult" or permanent set of teeth, starting at about six years old. The adult set has 32 teeth, 16 on the upper jaw and 16 on the lower. These include the four "wisdom" teeth, the backmost molars that erupt between ages 17-25 and are often removed to avoid crowding, eliminate hard-to-reach areas prone to cavities, or don't have enough room to erupt fully.

Tooth Structure

Teeth are made up of several different parts (see Figure 1):

Enamel
This is the hard, outermost layer. It covers the entire upper surface of the tooth, from the crown (the part above the gum line) to just above the root (the region below the gum line). Cementum, another hard substance, covers the root itself.

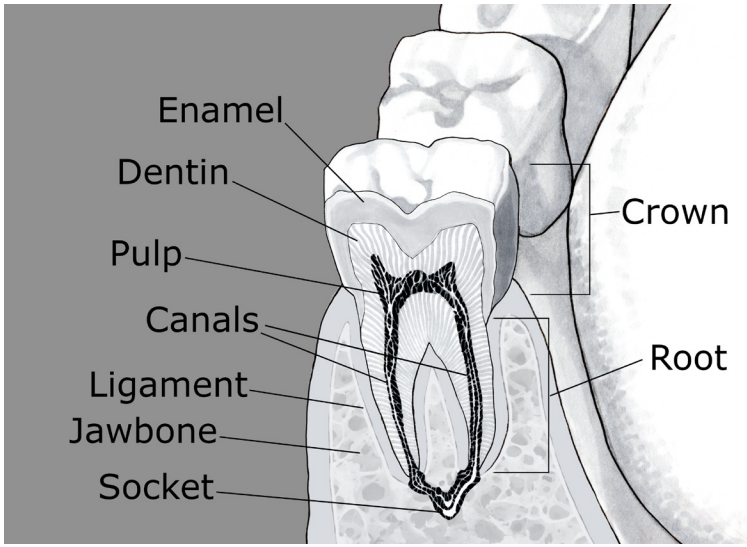

Figure 1: A cutaway of a premolar tooth in the lower jaw, revealing the tooth's structure.

Dentin
This material is softer than enamel and is a tooth's main calcium-containing part. It's located just beneath the enamel and surrounds the pulp chamber and root canals.

Pulp
This inner soft tissue contains nerves, blood vessels, and connective tissue. It lies under the dentin and extends from the crown to the root tip.

Canals
These channels within the root are filled with pulp and contain sensitive nerves. A tooth can have 1-3 canals, depending on its location in the mouth.

The entire tooth structure fits into a socket in the jawbone, and it's attached to a ligament in the socket that provides support for the tooth and strength for chewing.

WHAT ARE COMMON DENTAL CONDITIONS?

During our lives, most of us experience some kind of difficulty with our teeth. Usually, it's not severe, but it's important to appreciate what may be occurring and why.

Cavities

Cavities are holes that develop in the tooth's surface. The mouth usually contains a variety of bacteria, some beneficial and some harmful. The goal is to maximize the former and minimize the latter.

The harmful bacteria thrive on the sugary residue (called plaque) left behind from carbohydrate-containing foods such as milk, candy, cheese, and soft drinks. These bacteria produce acid as a byproduct; if the acid remains in the mouth, it eventually destroys the tooth enamel, creating pockets or holes. To prevent tooth loss, these holes must be cleaned and filled (discussed in more depth in the Dental Procedures section below).

Cavities can and do occur at any age. This makes routine care important for everyone, not just kids. In fact, certain changes that occur with aging can themselves lead to tooth decay. For example, when the gums recede from the teeth, they can expose the roots to plaque. The roots are covered with cementum, a hard tissue but softer than the crown's enamel. This makes them more susceptible to decay when exposed and more sensitive to touch and to hot and cold. Most people over age 50 have, at some point, experienced some form of tooth-root decay.

Also common is recurrent decay around the edges of already-existing fillings. Over time, fillings can weaken, leading to gaps that leak around the edges. Bacteria accumulate in these tiny, hard-to-reach cracks, promoting decay. These gaps can develop in people of any age.

Proper care, including brushing, flossing, and routine visits to the dentist, can prevent most cavities before they even get started.

Dry Mouth (Xerostomia)

Dry mouth is a condition where you don't produce enough saliva. This creates a dry, sticky feeling in your mouth and on your tongue and can lead to trouble chewing, swallowing, tasting, and/or speaking. It also creates difficulty for your teeth. Saliva not only helps to digest food, but it also helps to prevent tooth decay and infection by washing away bacteria, fungi, and food debris in the mouth.

Dry mouth results when the salivary glands don't function properly. This can be caused by several factors, including:

Medications
One of the most common side effects, especially for blood pressure, anti-anxiety, and antidepressant medications, is dry mouth.

Diseases
Some diseases, such as diabetes and Parkinson's, can cause dry mouth. Another condition, known as Sjögren's syndrome, is also one of the leading causes.

Radiation therapy and chemotherapy
Radiation can damage the salivary glands, and many chemotherapy drugs make the saliva thicker.

Nerve damage
Neck and head injuries can damage the nerves that tell the salivary glands to make saliva.

The specific treatment for dry mouth depends on the underlying cause. If it's medication-related, a dose adjustment might lessen the symptoms. If the glands can still produce some saliva, additional medications might help. Artificial saliva (like eye drops, made especially for the mouth) may also be helpful.

There are also several steps you can take to keep your mouth moist:

- Sip water or other sugarless drinks as often as you need
- Avoid drinks that contain caffeine, such as tea, coffee, or soda; caffeine has a drying effect on the mouth

- Chew sugarless (or xylitol-based) gum or suck on sugarless hard candy; these stimulate the flow of saliva
- Don't use tobacco or alcohol; both can dry out the mouth
- Avoid spicy or salty foods
- Use Biotene® rinse, which acts as artificial saliva

Rinsing out your mouth after eating can also help wash away the debris that could cause a problem.

Halitosis

Halitosis, or bad breath, is an "invisible" dental problem. It's the one most people don't even want to admit exists because they find it embarrassing. In fact, Americans spend almost one billion dollars each year[1] on over-the-counter breath fresheners and mouthwashes to cover up an unpleasant odor. But while these remedies may mask the smell, they don't address the underlying problem.

Some bad breath comes from the food you eat. The body absorbs the nutrients it needs and passes the more volatile compounds to the lungs, where they're expelled. This type of halitosis typically lasts from 24 to 72 hours. This is the time it takes for the body to eliminate the food completely.

For about 40 million people in the United States, though, the offending odor never goes away. There are three main causes of such lasting oral halitosis:

Improper dental care
If you don't brush and floss every day, particles of food remain in the mouth and build up into plaque. As we mentioned before, plaque attracts bacteria. In addition to producing acid, the bacteria generate sulfur compounds such as hydrogen sulfide and dimethyl sulfide — best known for developing the pungent smell of rotten eggs. Food that remains for long periods in the mouth, or food left on improperly cleaned dentures, can also rot, producing their own unpleasant odor.

Periodontal disease (see next section) also produces a characteristic foul odor. It's a sign that your gums aren't healthy and you need professional dental care.

1 https://www.statista.com/statistics/317866/us-households-total-amount-spent-on-oral-care-products-past-3-months/

Dry mouth
Since an adequate saliva supply is necessary to cleanse the mouth of food and bacteria, people with dry mouth tend to build up odor-causing bacteria, regardless of how much they brush and floss.

Medical disorders
Infections in the nose, throat, windpipe, or lungs; chronic sinusitis or bronchitis; gastroesophageal reflux disease; or a liver or kidney ailment can affect your breath. So can medications you're taking to treat those conditions. If your dentist determines your mouth is healthy, they may refer you to an internist or other specialist for help.

Proper dental care, including brushing and flossing twice daily, can help control or eliminate many cases of halitosis. Be cautious, though, about using alcohol-based mouth rinses. Alcohol dries out the mouth's soft tissues and leads to even faster production of the odor-causing bacteria. And a 1991 study published in the *Journal of the American Dental Association* indicated that mouthwashes "containing more than 25% alcohol could increase the risk of oral and pharyngeal cancers by about 50%."[2]

There is one exception to this — Listerine®. At 26.9 percent, it has the highest alcohol content of any over-the-counter mouth rinse. However, it also contains the American Dental Association's (ADA) seal of approval. Per the ADA's high standards, it needed to show a minimum of a 15 percent reduction in gum disease over at least two six-month studies and a mean of no less than 20 percent, which it did. In addition, it didn't increase the risk of cancer. It's therefore safe to use and makes a good addition to your dental hygiene routine.

In addition, see your dentist for regular check-ups. This will allow them to detect problems such as gum disease, xerostomia, or other disorders that may cause bad breath. While all dentists receive training during dental school on the causes and treatment of halitosis, some specialize in this condition. A quick internet search should find a list of specialists in your area.

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2 https://www.ada.org/en/resources/research/science-and-research-institute/oral-health-topics/mouthrinse-mouthwash

WHAT IS PERIODONTAL DISEASE?

Periodontal disease — also known simply as gum disease — is the primary cause of tooth loss in adults over 35.[3] It attacks not only the gums, but also the bone and other tooth-supporting structures.

Like cavities and halitosis, gum disease is most often caused by a build-up of bacterial plaque. If the plaque hardens (or calcifies), it turns into tartar (or calculus). It may be whitish, brown, or black, and the build-up can irritate the gingiva, the gum tissue located around the base of the teeth. Once irritated, pockets of bacteria may form between the gums and the teeth, resulting in inflamed gums that bleed easily.

Other causes include physical and chemical irritants, such as impacted food and tobacco products; badly aligned teeth or poorly fitting dentures; an unbalanced diet; certain medications, such as oral contraceptives, steroids, and cancer therapy drugs; and some diseases, such as diabetes, cirrhosis of the liver, and anemia.

The Stages

Gingivitis is the earliest stage of periodontal disease. The lack of warning pain or major discomfort at this stage makes it especially important to brush and floss daily and look for the signs of gingivitis when you do. These include:

- Tender, swollen gums, or gums that bleed, particularly when you brush or floss your teeth
- A change in the normal pink gum color to a dark or dusky red
- A receding gum line
- Pain when you chew
- Tartar build-up
- Overly sensitive teeth
- Chronic halitosis or a persistent bad taste in your mouth

If gingivitis remains untreated, the infection and inflammation can spread from the gums to the ligaments and bones that support the teeth. This may cause the teeth to become loose and eventually to fall out, a late stage of periodontitis.

3 https://www.nidcr.nih.gov/research/data-statistics/periodontal-disease

Diagnosis and Treatment

Gum disease is diagnosed through an oral examination and dental X-rays. First, the dentist checks the X-rays to determine if there are any gum pockets, where they're located, and if any bone has been lost.

Second, they use a probe to measure the space between the teeth and the gums. In a normal mouth, a V-shaped groove runs between the two, measuring at most three millimeters deep. If pockets form, the probe will push deeper into the gum tissue; how deep it goes indicates how far the infection has progressed. If it pushes in deeply, it indicates that the ligament holding the tooth in place has been damaged or destroyed.

The good news is you can prevent most cases of gum disease simply by brushing and flossing properly every day. If gum disease should develop, it can be treated, in one of several ways, depending on its severity:

A professional cleaning
Brushing and flossing at home is a must, but you can't always be as thorough as a dentist with specialized tools. A professional cleaning twice a year can help eliminate any build-up of bacterial plaque and tartar you couldn't reach.

Scaling and root planing
Scaling is a procedure that removes plaque and tartar beneath the gum line. To reduce the discomfort, the dentist administers a local anesthetic, such as lidocaine or carbocaine mixed with epinephrine. Then, using a small manual scaler or an ultrasonic cleaner, they clean the deposits down to the bottom of the periodontal pockets.

Root planing smooths the newly cleaned roots to allow the gum tissue to heal and reattach to the surface of the tooth, as well as to prevent bacteria from being able to stick to the surface as easily.

After root planing, many dentists apply Arestin® (or Atridox®) to the pocket around the root surface. The drug's microspheres release an antibiotic over time, targeting the infectious bacteria to reduce pocket depth. This allows the gums to heal better than with scaling and root planing alone.

Gingivectomy
While this procedure uses a laser to surgically remove the periodontal pocket, allowing easier access for proper, routine cleaning, it's more commonly used for cosmetic reasons, such as a gummy smile. One advantage it does have is that the focused light cauterizes the tissue as it goes, destroying the infection and relieving the need to use an antibiotic.

Flap surgery
Flap surgery is reserved for extremely severe cases of periodontitis, as it's very invasive. In this procedure, the dentist cuts a flap in the gum tissue, allowing access to the tooth root to remove plaque, tartar, and diseased tissue. Once cleaned, they stitch the flap back into place and let the gums heal.

No matter how severe the disease, the goal sof any periodontal treatment are to reduce the infection and to correct the condition(s) that caused it. Your dentist may recommend using an antibiotic to supplement any procedure they do. They may also recommend an antiseptic mouth rinse to use at home.

If your general dentist believes the infection is too advanced to address in their office, they may recommend you see a periodontist, a dentist specializing in the prevention, diagnosis, and treatment of gum disease.

Left alone, periodontal disease won't go away; it must be treated by a professional. Early detection and treatment are the keys to preventing pain and discomfort and to saving your teeth.

WHAT IS ROUTINE DENTAL CARE?

We've discussed the need for routine dental check-ups — the ADA and most dentists recommend twice a year. But what can you expect when you go sit in the chair?

Dental Cleanings

Routine visits start with cleaning the teeth to eliminate any plaque and tartar build-up that everyday brushing leaves behind. Once the teeth are clean, the dentist inspects all tooth surfaces to determine if any cavities or periodontal problems have developed since your last visit.

Generally, they take a full-mouth series of X-rays (four bitewings or a panoramic view) to reveal anything not visible to the naked eye.

If they find a cavity, they schedule you for another appointment to have it filled. If they discover any other problem, they recommend a course of action determined by its severity (as described in the previous section). This may include follow-up appointments at the office for scaling and root planing, root canals or crowns, or a recommendation to see a specialist.

Oral Cancer Screening

The dentist also examines all the oral tissues for suspicious lumps or sores that might indicate cancerous or precancerous lesions. If anything looks suspicious, they send you to an oral surgeon, who takes a biopsy, a small tissue sample that a pathologist examines closely.

The Oral CDx Brush Biopsy,[4] which uses a mouth swab to collect suspicious-looking cells, is a painless procedure that requires no anesthetic and causes no bleeding. It used to be the norm for oral cancer screening but has fallen out of favor as technology has advanced.

The VELscope®,[5] a hand-held device that uses the oral mucosa's natural fluorescence, has now become the gold standard for oral cancer detection. The scope enhances the visualization of precancerous lesions, oral cancer, and other disease processes

4 https://www.cdxdiagnostics.com/oralcdx

5 https://velscope.com

far beyond what the naked eye can detect (see Figure 2). If the dentist finds any tissue abnormalities, they send you to an oral surgeon and/or an oncologist for follow-up.

Figure 2: The VELscope© LED Dental, Inc.©2024. Used with permission.

Preventive Measures

Most dentists will also counsel you on proper brushing and flossing techniques, nutrition, and other preventive measures you can take to keep your teeth healthy.

Children shouldn't be left out of the conversation when it comes to health prevention. Dentists frequently use two preventive treatments to help protect their developing teeth. These treatments can also be used on vulnerable adults.

Dental sealants

Dental sealants are thin coatings painted on the biting surfaces of the back molars to prevent cavity development. They're usually made from composite resin, a tooth-colored compound that protects against enamel damage and decay; however, they can also be manufactured from a glass ionomer or polyacid resin material.

According to the Centers for Disease Control and Prevention (CDC), studies have found that children ages 6-11 who don't get sealants have almost three times more cavities on their first set of molars than those who get sealants.[6]

When applied, sealants flow into the deep grooves and pits of the biting surfaces of the back teeth and harden immediately. They form a physical barrier that protects tooth enamel from plaque and acid. They're also usually long-lasting, not needing to be reapplied for many years, though some wear away in just a couple of years if there's excessive tooth wear. They're most effective if they're used when a child's first set of molars comes in (about six years old), and when the second set comes in (about 12 years old).

6 https://www.cdc.gov/oralhealth/dental_sealant_program/index.htm

Sealants are quick, easy, and painless — kid-friendly — and can prevent up to 80 percent of the cavities children get in the hard-to-reach back teeth, where, the CDC indicates, 9 in 10 cavities occur. That helps reduce the need for invasive and expensive procedures down the line, such as dental fillings and crowns.[7]

Fluoride treatment

The second treatment is fluoride, a naturally occurring mineral found in water and often added to municipalities' water supplies to aid dental health. Dental providers also use fluoride directly as a treatment method to reduce the risk of decay.

Every day, your teeth's enamel covering gains and loses minerals. When bacteria feed on sugars and form acids, you lose minerals, which etch away at the enamel.

You gain minerals — such as fluoride, calcium, and phosphate — when you ingest food and drinks that contain them, as well as when you use fluoride toothpaste and mouthwash. When you lose more than you gain, your teeth become vulnerable to decay.

Your dentist can also apply fluoride to the teeth in the form of:

- Foam: dispensed into a custom tray, then placed over the teeth
- Varnish: painted directly on the teeth
- Gel: either painted on or dispensed in a custom tray

The ADA cautions against using too much fluoride with infants and young children, as it can lead to enamel fluorosis — faint white streaks on the teeth's enamel during a child's developmental years, even before the teeth erupt through the gums. Older children and adults are less sensitive to it.

7 https://www.cdc.gov/vitalsigns/pdf/2016-10-vitalsigns.pdf

WHAT ARE SOME COMMON DENTAL PROCEDURES?

There are several dental procedures you may encounter over the years. These include:

Fillings

Just as cavities are the most common dental condition, fillings are the most common dental procedure. Fillings help retain the tooth's shape and function while preventing further decay.

Amalgam, a mixture of silver, copper, tin, and sometimes zinc combined with mercury, used to be the most widely used filling material. Unfortunately, it's easily detected in the mouth, and it's drawn controversy over the last several years because some people believe the mercury emits small amounts of vapor that cause various health problems ranging from multiple sclerosis and arthritis to mental disorders.

However, several investigations by the federal government have not shown this to be the case, and its use is supported by the Food and Drug Administration, the National Institute on Dental and Craniofacial Research, and the ADA, among others.[8]

Still, amalgam's use is declining with the invention of new composite resins. These tooth-colored, plastic materials are difficult to distinguish from natural teeth and are often used on the front teeth, where appearance is important. Their big drawback, as far as patients are concerned, is their cost, but the figures will most likely decrease as the use of resin increases.

Root Canals

If a cavity remains untreated, the infection can spread inward to the pulp and sensitive nerve. In addition, it may cause an abscess, infected tissue that oozes pus at the root tip and in the jawbone. This causes swelling and often a great deal of pain.

Such abscesses can also be caused by trauma, such as a physical blow to the tooth or excessive clenching or grinding, cracks in the enamel, or by physical irritation, such as from a very large filling.

8 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3388771/

It used to be that dentists would simply remove a tooth that had become diseased, either leaving a gap or replacing it with a bridge (see below). Today, the goal has become to try to save as much of a person's teeth as possible since 1) they provide the "best fit" for a fully functional mouth, and 2) their presence helps prevent further bone loss in the jaw.

To save the tooth, your general dentist performs a root canal procedure (or will send you to an endodontist, a dentist who specializes in diseases of the pulp, to do it). This is a multi-step process that may require anywhere from one to three separate visits to complete.

The steps include:

Numbing the mouth
The dentist numbs the area with a local anesthetic for two reasons: 1) they'll be working on a very sensitive tooth, and 2) numbing the mouth relieves a lot of a patient's dental anxiety. They may also isolate the tooth with a rubber dam, a sheet that confines the treatment area and prevents the pus and chemical agents from contaminating the rest of the mouth.

Opening the crown
The dentist makes a hole in the top of the tooth with a drill, exposing the pulp.

Removing the pulp
They clean, enlarge, and shape the canal that houses the pulp. Since some teeth have multiple canals, the dentist checks to ensure all are free of infection, both by physical examination and X-rays. They also fill the canal(s) with medication to remove any remaining bacteria and prevent reinfection.

Filling the tooth with a temporary seal
A tooth that may still contain a lingering infection mustn't be permanently sealed. A temporary filling allows you to resume your daily activities (including eating) and return about a week later for the rest of the procedure once fully healed. Your dentist may also prescribe an oral antibiotic to ensure the infection is wiped out entirely, but, if the area looks clean, they may forgo this, as too many antibiotics can lead to resistant bacterial strains.

Filling the tooth permanently
At the next visit, ideally within a week so the tooth doesn't become reinfected, the dentist removes the temporary filling and seals the tooth with a hard, permanent one.

Once a tooth has been through a root canal, it becomes more brittle. In many cases, the dentist will add a crown (or cap) on top of the tooth root for additional support.

Crowns and Bridges

When a tooth is missing, it alters the support and chewing forces in the mouth, and the remaining teeth may begin to shift. This is not only true for the teeth on either side of the lost tooth. The opposing tooth, either above or below, becomes free to move up or down out of its socket, further accelerating periodontal disease and the process of bone loss.

Crowns are coverings placed on top of an existing tooth. They're used to support a tooth when it doesn't have enough structure left to hold a filling, to protect the structure of a broken or cracked tooth, to prevent fractures in root canal-treated teeth, and to serve as attachments for fixed bridges. Like root canals, crowns are a measure to save a person's natural teeth.

Losing a tooth is sometimes unavoidable, whether it's from decay, gum disease, or an accident. Bridges are custom-made devices that replace one or more missing teeth and are anchored to the crowned teeth that surround the gap.

Both crowns and bridges are made from semiprecious and precious metals, porcelain, or zirconia, a strong, tooth-colored material. The dentist considers the appearance and function of the devices when selecting the materials to make them look and act as natural as possible. Once inserted, you care for these devices just as you would your natural teeth, by brushing and flossing daily, and by scheduling twice-yearly visits with your dentist. Again, if you have any questions about their proper care, ask!

Laser dentistry

In 1997, the US Food and Drug Administration approved the erbium-YAG laser developed by Premier Laser Systems for the

treatment of tooth decay. The Irvine, California-based company reported that the laser can repair a cavity without the pressure and vibration of a drill. Dental lasers appeared in clinical practices starting in 1989, and they're currently FDA-approved for many different types of dental concerns.[9]

Lasers focus a single wavelength of light into a strong, cohesive beam that dentists use to target a specific problem. When directed at tooth or gum tissue, the laser can remove or reshape that tissue.

Laser dentistry is a leap forward from traditional probes, drills, and scalpels. It provides a more precise, comfortable, and efficient option for treating oral health issues for hard and soft tissues.

Lasers that are used to treat periodontal disease emit wavelengths absorbed by the water and hemoglobin in the gum tissue and connected blood vessels. As they cut away diseased tissue, the lasers also seal blood vessels and nerve endings. This prevents major bleeding, desensitizes the nerves, and sterilizes the remaining tissue, eradicating the infection while activating tissue regrowth to heal the area.

Laser dentistry provides many benefits.

Powerful but safe
Lasers are powerful tools but safe when used by trained dental professionals. They can treat tooth decay and tissue damaged by periodontal disease while ensuring surrounding areas remain unharmed.

Less anxiety
Dental anxiety affects about 36 percent of Americans, with the sound of the dentist's drill creating one of the main fears. This sound is often equated with pain (see discussion below). Lasers, though, are much quieter than a drill and less intrusive. That may make you more willing to come in for routine check-ups, so we can catch and treat decay and gum disease while they're in their early stages and more easily repaired.[10]

9 https://www.nytimes.com/1997/05/08/us/fda-approves-near-painless-dental-laser.html
10 https://my.clevelandclinic.org/health/diseases/22594-dentophobia-fear-of-dentists

Less pain and anesthesia
Lasers don't cause as much pain as traditional dental procedures, which means you'll probably need less anesthesia — sometimes none at all. However, that's mostly true only for soft-tissue lasers used for gum tissue and pulp. Hard-tissue lasers used for teeth can take an extremely long time to reach a deep cavity, often necessitating anesthesia and a drill.

Targeted treatment
Because the dentist can control the laser's beam more precisely than the path of a traditional drill, they may not need to remove as much gum tissue, leaving areas around the damaged tissue unscathed.

Faster recovery
Recovery is faster with a laser for two reasons: 1) the laser sterilizes the tissue as it goes, so the infection clears more quickly, and 2) the laser cauterizes the blood vessels, so you bleed relatively little during the procedure and after-the-fact.

Teeth Whitening

Teeth whitening is one of the fastest-growing areas of dental care. According to Healthline, in 2015, Americans spent over $11 billion on in-office and at-home teeth whitening products, and it's just shot up from there.[11]

Normal, healthy teeth are white or yellowish-white; according to the US National Library of Medicine, anything else is "abnormal." Abnormal, though, doesn't mean dangerous. Teeth can become stained or discolored over time from extrinsic and intrinsic factors.

Enamel is the hardest substance your body produces, even harder than bone. Extrinsic factors affect this shell, which is easily stained despite its hardness. Fortunately, most of these stains can be removed by the tooth whitening process.

11 https://www.healthline.com/nutrition/whiten-teeth-naturally

The most common reason for **extrinsic** discoloration is what you put in your mouth. Some common stain-causing substances are drinks like coffee, tea, dark sodas, and red wine; fruits like cherries, blueberries, pomegranates, and beets; and tobacco.

Acidic foods and drinks like carbonated beverages and citrus are also to blame; they promote staining by etching away the tooth enamel. That allows pigments to stick more easily to the soft inner tissues.

Intrinsic factors affect dentin, the layer just below the enamel that protects the inner pulp. Unfortunately, these stains are more difficult to remove than extrinsically caused ones. The biggest contributing factor to discolored dentin is aging. As you age, the enamel covering your teeth thins, and it's easier to see the dentin's dull yellow color through it. Other contributing factors are medications that cause tooth yellowing, including antibiotics like tetracycline and chemotherapy and radiation treatment for cancer.

You're generally a good candidate for tooth whitening if your teeth are stained or otherwise discolored. And it's up to you whether you want to go with an in-office or at-home treatment; it largely depends on your oral health, lifestyle, and personal preferences. You and your dentist can discuss your options at your consultation.

Be aware, though, that if you have tooth decay, tooth damage, gum disease, or other dental problems, the dentist must address them first to ensure your oral health is the best it can be.

Every dentist has their own preference for which whitening system they use. Some common ones include Zoom!® from Phillips, GLO™ Science, and Opalescence™.

For an in-office procedure, the dentist first places the whitening gel, which contains some form of peroxide, a bleaching agent, into a custom-made tray. They cover your lips and gums to prevent irritation, then place the tray over your teeth. If they're

using Zoom! or GLO Science, they activate the gel with a blue LED light, and you sit back while it goes to work. Opalescence doesn't use light, as their research suggests it's not needed for the process.[12]

Zoom! whitens your teeth by at least several shades in a treatment session lasting under an hour; other systems work a bit slower. If you opt for an at-home kit, you'll also get results, but since the gel contains less concentrated peroxide (for safety reasons) than the in-office treatments, it may take a little longer to get the desired results.

Veneers

Veneers are a primarily cosmetic option that cover up stains, but they also do much more. Dental veneers are custom-made, extremely thin shells the dentist bonds to the front surface of your tooth. They can change its color, size, shape, or length and work especially well for your highly visible front teeth. They're better than dental crowns because they require less shaving of surface enamel, but if your tooth already has a lot of filling material, a crown is a better option.

Veneers on their own don't improve your oral health, but they're resistant to both acid and decay, so they help improve your overall oral hygiene while boosting your smile.

Dental veneers are made from either porcelain or resin composite materials, but most dentists choose porcelain because:

- It resists stains better than resin
- It's stronger than resin
- It looks more like your natural teeth in color and how it reflects light

Dental veneers are a good option for patients looking for a long-term solution to cosmetic dental problems but who don't respond well to treatments such as teeth whitening or

12 https://www.opalescence.com/education/faq

orthodontia. Your dentist can place them fairly quickly, but you should know they're initially more costly than crowns, and because they're not indestructible, replacing them can rack up the costs over time.

Most veneers last about 10 years if they're made of porcelain, according to the ADA, and they offer many health benefits.[13]

Restore and strengthen damaged teeth
If you have small chips or cracks in your teeth, veneers can cover them, preventing decay-causing bacteria and food debris from getting into the inner pulp chamber. And because they're permanently bonded to the front tooth surface, they also strengthen weak enamel, making the tooth more acid- and decay-resistant.

Fill in gaps and spaces
Gapped teeth might seem alluring, but those gaps can attract plaque, debris, and decay-causing bacteria. Gaps can also lead to bite misalignments and structural stress, which can cause tooth fractures and even tooth loss. Bonded to the teeth on either side of the gap, veneers effectively bridge them, giving you a strong, closed surface and an even bite.

Restore tooth color and shape
As mentioned in the teeth whitening section, teeth become stained over time due to extrinsic and intrinsic factors. Veneers effectively cover the discoloration, brightening and whitening your look. They're also ideal if you're too sensitive to the whitening gels. And if you have a tooth that's shorter than its neighbors, veneers can bring it in line with the rest of your teeth.

Make maintenance easy
Veneers don't just look like your natural teeth, but they also act like them. Yes, you need to brush and floss every day, just like you always did, and you should visit your dentist twice a year for professional cleanings and check-ups, but the veneers don't need any special handling.

13 https://www.colgate.com/en-us/oral-health/veneers/how-long-do-veneers-last

Tooth Extraction

Dentists are in the business of saving teeth, not extracting them. However, in cases of severe disease or injury, they may decide it's better for your oral health to extract a tooth rather than suffer the consequences of holding on to it. Some do the work themselves, while others refer you to an oral surgeon, especially if it's a back tooth and hard to get at.

Here are some reasons your dentist may choose to perform an extraction.

Tooth decay, disease, and infection
Failing to brush and floss properly leads to a build-up of bacteria, which turns into a sticky plaque that can harden into difficult-to-remove tartar. In addition, the bacteria's acid byproducts eat away the enamel covering the teeth, leading to decay. If caught early enough, the dentist can fill the hole with amalgam or composite fillings. However, if the decay reaches the internal blood vessels and nerves, the tissue can become infected, causing pain and inflammation.

We've seen that a root canal procedure removes the inner tissue and nerve, saving the tooth root in the process; when done, it's topped by an artificial crown. Sometimes, though, an infection is so advanced that neither a root canal nor any antibiotic can kill it. In these cases, tooth extraction may be the only option to remove the infection and preserve your oral health.

Injury or trauma
Sometimes accidents from a car collision, sports, or even a fall, involve your teeth. A cracked or broken tooth is not only unstable, but it can also cause damage to nearby teeth or the gums. Your dentist will check to see if the tooth can be saved and restored with a filling or crown, but they may have to extract it if it's too badly damaged to repair.

Abnormal tooth development
Not all teeth erupt through the gums as they should, and they can become impacted (trapped between the bone and the gum). This most commonly happens with wisdom teeth, your third set of molars, which come in between ages 17-25.

With your mouth filled with 28 permanent teeth, you may not have enough room for the large wisdom teeth to fit. In addition, if the teeth are impacted, they're more likely to become infected or be associated with complications, such as pain and inflammation. As a result, they're often extracted proactively, to prevent future problems. And because these teeth are evolutionary relics from a time when our diet was coarser and needed the crushing power of these third molars, extraction doesn't damage your oral health but protects it instead.

The dentist may also recommend tooth extraction for children whose baby teeth haven't fallen out at the correct time, though they often wait a couple of years after the expected time to ensure they won't fall out on their own. Extraction encourages the adult teeth to erupt on time and in the correct positions, reducing the need for orthodontia.

Crowded teeth/orthodontia
Some people have a small jawbone that doesn't provide enough room to hold all adult teeth in the correct positions, and the teeth become crowded and misaligned. This can lead to excessive wear-and-tear, chipped teeth, gum irritation, and difficulty chewing. A small, crowded mouth can also prove problematic for moving teeth with orthodontic treatment.

One possibility to get around this problem is to use palate expanders to widen the upper jaw and allow more space for the teeth to be aligned; the other is to extract some of the teeth already present. In addition, teeth that are too large for the size of the mouth may also need to be extracted so they don't get in the way of moving the other teeth.

Your dentist, orthodontist, or oral surgeon extracts all the problem teeth before installing the braces; they almost always remove the teeth symmetrically to maintain the balance of your bite.

Partial and Full Dentures

Replacing missing teeth is important to restoring good oral health, and it's a more pressing problem than you think — studies show that around 178 million Americans are missing at least one natural tooth, and some 40 million have lost all their teeth.[14]

We've already talked about crowns, bridges, and veneers as restoration options, but there are more we need to consider, especially when you're missing multiple teeth, both the crown and the root.

We'll talk about the new gold standard of replacement options, the dental implant, shortly. But it's important to know that 90 percent of people with missing teeth still wear some form of denture, custom-made artificial teeth that can replace a few or all of your missing teeth.[15]

The common (mis)perception of dentures is the clunky set your grandmother wore and put in a cup beside her bed each night. Dental technology, though, has vastly improved over time. Today's dentures are more comfortable than anything available in your grandmother's lifetime, and they're also more natural-looking, so no one will know you're sporting replacements.

Partial dentures
Partial dentures are a good choice if you're replacing several missing teeth, and they can be used in either the upper or lower jaw or both. The prosthetic teeth are made from acrylic, so they're durable. They're fused to either an acrylic or metal frame. Small metal clasps extend from the frame and wrap around remaining natural teeth, and/or a snap-in connection can be added to anchor the appliance in your mouth. Each replacement tooth blends in with your surrounding teeth in color, size, and shape.

Unless your partial is secured permanently to an implant, you remove it every night for cleaning. Most people are comfortable

14 https://www.prosthodontics.org/assets/1/7/ACP_Talking_points_for_Missing_Teeth_1-12-15.pdf

15 https://www.gotoapro.org/facts-figures/

with the upper plate, even though it might rock some, but many people have difficulty with a lower partial because it can slip, clack, or even pop out of your mouth if you push on it with your tongue.

Full dentures
Full dentures replace all your teeth in the upper and lower dental arches, either because they've fallen out over time or because they've been extracted due to decay or infection. The replacement teeth are usually made from acrylic resin, and they're shaped and sized to fit your mouth and facial structure. They're secured to an acrylic base shaded to appear like natural gum tissue.

The base fits snugly over your gums and is designed to give you a balanced bite. Traditional full dentures are held in place by suction between the base and gums or with a dental adhesive like Polygrip® or Fixodent®. This new set of teeth allows you to bite and chew most foods and helps prevent your mouth and cheeks from sagging due to lack of support.

However, most people need a few weeks to adjust to wearing full dentures. This is often because the dentist almost always needs to make several small changes to get just the right fit for you, and you have to break in each change. The adjustment is due, in part, because they can slip and slide when you chew, and you need to learn how to control that. And it's due, in part, because you need to learn again where to place your tongue to speak normally.

Another option is implant-supported dentures, but we'll discuss those below in the Dental Implants section.

Adjusting to life with dentures
If you're missing all your teeth, there's no question that dentures are an easier and less expensive replacement option than getting a whole arch of dental implants, but as we said, they require some getting used to before you'll feel like your old self again.

You should also be aware that, even though these teeth were custom-built for your mouth, they may require minor adjustments before they're comfortable. They may press on one spot too tightly, the flanges at the back may be a tad long,

or any of a few other small things. The dentist works with you to remove the problems so you can get used to your new teeth. While some people don't require any adjustments, the average person will need 4-8 office visits to make things good to go.

You'll probably experience minor gum irritation, mouth soreness, and/or increased saliva in the first few days. These are all perfectly normal, so keep your teeth in as much as possible to get used to them.

Learning to chew again can be challenging, but you can make it easier by starting with soft foods like smoothies, yogurt, and pudding. Add firmer foods in bite-sized pieces, and practice chewing on each side of your mouth. After a bit of practice, you'll be back up to your normal diet, though you may have some difficulty with very hard or very chewy foods.

Speaking clearly with full dentures can be another challenge and requires practice, as your new teeth might clack a bit, and your tongue has to get used to the "feel" of its new environment. Try speaking out loud with yourself and reading out loud. Start slowly, learning where your tongue needs to go to make each sound. Once you feel ready to talk with another person, get a friend or family member you trust and practice with them.

Though they'll probably be a bit uncomfortable initially, your dentures should never hurt. If you feel pain, call your dentist and schedule a time for an adjustment.

Dental Implants

Your oral health is best when all the parts of your mouth work efficiently together. When you're missing teeth, you're missing a key player, and that causes problems. Research indicates that your risk for additional dental and systemic health problems goes up with each additional tooth you lose.[16]

Missing teeth cause **malocclusions** (bite problems) as your remaining teeth shift into the new gap, causing difficulty chewing and speaking.

16 https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/dental/art-20047475

Missing teeth change **how you eat** and what you eat. You use your front teeth for biting and your molars for grinding tough foods and large pieces. When you no longer have these teeth, your diet and how you eat it necessarily change.

Missing teeth impact the **digestion of food**. An inability to chew correctly because the teeth you need aren't there causes problems like acid reflux. In addition, diet changes can lead to difficulty digesting what you can consume.

Missing teeth **fail to stimulate** the jawbone. Your jaw needs biting and chewing pressure to create new tissue to replace old, but if the teeth are missing, the bone atrophies. This can cause nearby teeth to loosen and even fall out.

With all the teeth restoration options, we haven't yet discussed what is now considered the gold standard: the dental implant.

All the options we've mentioned serve their purposes, but they all fail in a major way — they merely replace the tooth crowns, the visible parts above the gum line; they don't have a root to secure the appliance in the jawbone. Dental implants, on the other hand, are designed to replace all parts of the tooth's structure — a titanium "root" that holds the tooth in the jawbone and provides the bite pressure to stimulate bone growth, an abutment (connector, and a dental crown, bridge, or denture to replace the visible portion.

Additional Implant Options

Implants can also anchor full dentures, with one implant per missing tooth, several strategically placed implants to support an overdenture, or the All-on-4® system.

If you're replacing a full arch of teeth, individual dental implants can be both time-consuming and expensive. The All-on-4 system replaces the upper or lower arch using only four strategically placed implants. As with individual implants, the dentist attaches the abutments to the titanium posts, but instead of fashioning individual crowns, the full denture serves the above-the-gum-line function. With this system, the denture is permanently placed, so you brush your teeth in the mouth instead of taking them out to clean.

In addition, the All-on-4 system provides snap locking between the implants and the denture at the four locations, holding the denture secure. That means you don't have the clicking or slipping you see with dentures alone.

The implant procedure
Placing dental implants is an in-office procedure, which may be performed by your dentist alone or with the help of an oral surgeon. If you're getting full dentures for the crowns and still have some teeth and/or tooth roots in your mouth, those must be extracted before the implant process begins. Allow at least a couple of months for your mouth to heal enough from the extractions that you can move forward with the implants.

Once you start, the entire process for implants takes at least 3-6 months, most of which is healing time.

The initial step takes about 1-2 hours. The surgeon gives you a local or general anesthetic, so you'll be comfortable during the procedure. Then, they carefully make one or more incisions in your gums, depending on how many implants they're placing. Next, they drill tiny holes in your jawbone. If you've had only local anesthesia, you'll feel a lot of pressure but no pain. They insert the titanium post that will serve as the tooth root into the hole, then suture your gums closed.

The next step is osseointegration, where the jawbone grows around the post and eventually fuses to it, securing it in the tooth socket. This is the part that takes 3-6 months, on average. During this time, the dentist provides you with temporary dentures so you can eat and talk.

Once the area heals, you come back into the office. The dentist screws an abutment on top of each implant, which serves to effectively connect it with the denture laid on top and stabilize it in the mouth. Once completed, your implanted tooth will look and behave the same as any natural tooth. And, if you maintain good oral hygiene, the implants should last you a lifetime, though you may have to replace the dentures at some point.

WHAT IS A DENTAL EMERGENCY?

Sure, you've had an injury and one or more of your teeth were affected, but how do you know if you have a dental emergency? Well, if you chip a veneer or cut your lip or bruise your face, it may be annoying and a bit uncomfortable, but none of these must be treated right that second.

You can determine whether you have a true dental emergency if you ask yourself:

- Is your mouth bleeding?
- Are your gums or teeth in severe pain?
- Do you have any loose teeth or a tooth that's been knocked out?
- Do you have any facial swelling?
- Do you have any bulges or swellings on your gums?

If you answer yes to any question, you have an emergency. That means you need to see the dentist right away.

Here are several scenarios that require emergency dental care and what you should do while you're on your way to the office.

Knocked-out tooth

Having a permanent tooth knocked out of its socket requires urgent attention because you have a window of about an hour before the dentist won't be able to save it. These are the steps you need to take:

1. Never touch the root; pick the tooth up by its crown
2. Gently rinse the tooth with water to eliminate debris, but don't scrub or remove any tissue
3. Try to put the tooth back into its socket; bite down on some gauze to hold it in place
4. If you can't replace the tooth, put it in a cup of milk
5. Call your dentist and let them know you're on your way

If you wait too long to get help, or if the socket is damaged, the dentist won't be able to reimplant the tooth. If either of these happens, they'll discuss restoration options with you.

Loose tooth or tooth pushed out of alignment
Loose teeth or teeth knocked out of alignment are dental emergencies since the tooth (and the surrounding gum tissue) is likely damaged.

Call your dentist to make an emergency appointment. Use gentle pressure to see if you can put the tooth back in its proper position, but don't force it. Bite down on the tooth to prevent it from moving. When you reach the office, the dentist will most likely splint the tooth to an adjacent, undamaged one. That keeps it stable while it's healing.

Chipped, cracked, or broken teeth

If you chip a tooth, but it doesn't hurt, it generally isn't a dental emergency; you can wait to schedule a regular office appointment. The dentist smooths the rough edge or adds some resin composite to repair it.

However, if your tooth is visibly cracked or fractured, it's a dental emergency because the inner part of the tooth is also probably damaged. Call your dentist's office immediately for an emergency appointment. Before you go:

- Rinse your mouth out gently with warm water
- If your dentist okays it, take over-the-counter ibuprofen (never aspirin) to alleviate pain
- Never apply a painkiller, including Anbesol®, Orajel®, or other numbing agent, to the damaged tooth; it can burn the gum tissue

When you arrive, the dentist takes an X-ray of the tooth to properly diagnose its condition. If the soft inner pulp is damaged, your tooth may need a root canal. If it isn't damaged, you may only need a crown. If the tooth can't be saved, the doctor discusses extraction and restoration options with you.

Tissue injury

Puncture wounds, lacerations, and tears to the lips, mouth, tongue, and cheeks are all dental emergencies. Clean the wound immediately with warm water. If your tongue is

bleeding, pull it gently forward and press down on the wound with some gauze. Make your way to the nearest emergency room for treatment and follow up with your dentist once you're stable.

Infections and abscesses

As discussed in the sections on periodontal disease and root canals, a widespread dental infection or abscess (pus-filled cyst, often on the tooth root) can be life-threatening. Signs of such problems include almost unbearable pain and a tooth intensely sensitive to hot and cold — and even air movement.

Call your dentist immediately for an appointment. They'll most likely lance the abscess, allowing it to drain, and they may also perform (or send you to an endodontist to complete) the first part of a root canal. Removing the inner pulp and affected nerve alleviates pain and saves the tooth root.

HOW DO I CHOOSE A DENTIST?

You already know a bit about what to expect from a dental visit. But if you don't already have a dentist, how do you start?

Word-of-mouth is always the best way to go. If you don't have a recommendation, you'll have to go through an impersonal listing, such as an organization or Dr. Google (you can also find some listings in the Resources section below).

The important thing to remember is that no matter where you look, shopping for a good dentist is like shopping for any other valuable commodity. You need to know what you're looking for; what information you need to know, and therefore, what questions to ask; and how much you're willing to pay for the service.

Fees and Logistics

Look for the best combination of factors, such as a convenient location, reasonable office hours, and if the dentist participates in your health insurance plan. And not every dentist charges the same amount for the same procedure. Ask for estimates on office visits that include cleaning and oral exams, emergency visits, full-mouth X-rays, and different fillings.

Personality

Never underestimate the importance of getting along with your dentist, especially if you're prone to anxiety. Choose someone willing to take the time to answer your questions, explain procedures, and make you feel like a person, not just a mouth in the chair. Be upfront with your concerns, no matter how trivial. The more information the dentist has, the better they can treat you.

Records

If you already have a dentist but want to transfer to a new person, ensure you get a copy of your dental records to bring with you, or have your current office transfer them over. You have a right to those records. The ADA Principles of Ethics and Code of Professional Conduct states: "A dentist has the ethical obligation on request of either the patient or the patient's new dentist to furnish, either gratuitously or for nominal cost, such

dental records or copies or summaries of them, including dental X-rays or copies of them, as will be beneficial for the future treatment of that patient. This obligation exists whether or not the patient's account is paid in full."[17]

While you have a right to a copy of your records, that doesn't necessarily mean that your dental office will give them to you free. Make sure you ask them what they charge for this service.

17 https://www.ada.org/about/principles/code-of-ethics?gad=1&gclid=Cj0KCQiAjMKqBhCgARIsAPDgWlw-gZYCZTHqisXrlu8FwM0nV6vU1LFZFR4K2W54SIH9VV0lbI3V4KkaAhZTEALw_wcB

WHAT DO I DO ABOUT DENTAL ANXIETY?

So, now you've got a dentist and a working knowledge of what a dental visit entails. As we've mentioned, though, for many people, that's not enough; fear or anxiety overwhelms reason, and they put off making an appointment even when they know they have a problem. The price for that delay is steep financially and medically — a cavity that currently requires a small, say, $200 filling might grow so large the tooth requires a $900-$1000 crown. Left even longer until gum disease sets in, the tooth may need a $1,500 root canal.

Such delays are also painful for your mouth; dental anesthetic doesn't work as effectively when you have an infection. If left untreated, tooth and gum disease may lead to other serious medical conditions, as described in the section below.

When you feel the anxiety rising, it's important to remember that you're not alone. DentaVox, a market research firm, surveyed 18,000 people globally about their dental anxiety. A whopping 61 percent of respondents said they suffered from dental fear, and another four percent had a phobia so severe they'd never been to a dentist.[18] The most common dental anxieties reported, in order of prevalence, are:

1. Fear of pain
2. Discomfort from chemical smells
3. Fear of the sound of the drill
4. Dreading being stuck in the dentist's chair
5. Having to keep their mouth open for long periods

Whatever causes your anxiety, it can have far-reaching repercussions. You jeopardize your long-term oral health by skipping routine visits or failing to seek help when you have an emergency. That leaves you with more pain, in-chair time, and higher dental costs.

Sedation Dentistry

Today, more and more dentists are providing sedation dentistry, which is offered in various forms. Some give you an oral

18 https://www.dentalproductsreport.com/view/study-finds-more-60-percent-people-suffer-dental-fear

sedative, such as Valium®, that you take about an hour before your appointment. You remain wide awake and aware of what's happening throughout the procedure, but you're less anxious about being there.

Some use nitrous oxide, better known as laughing gas. You remain aware of what's happening, but as long as you're breathing the gas, you feel "distanced" from it.

Still others are certified in intravenous sedation. You receive the sedative through an IV in your arm. You're technically in a twilight sleep, so you're not aware of what's going on, and you probably won't be able to remember what happened. You'll be groggy for several hours after you wake up, so you'll need someone to drive you home and ensure you're okay.

Self-Help Tips

You can also learn to help yourself. The following are some tips to help you master your dental anxiety:

Breathe
It's almost instinctive to hold your breath when you feel — or anticipate — discomfort, particularly during an injection. Lack of oxygen, though, increases anxiety and magnifies pain. Concentrate on keeping your breathing slow and steady. Breathe in through your nose to the count of four, then out through your mouth to the count of six. Repeat until the procedure is finished.

Focus your attention elsewhere
When you fixate on the drill, the light, the tooth, or the dentist, you amplify your pain sensation. Think of something pleasant, and give your mind permission to stay there. You can also focus on your breathing; keep it slow and regular, almost hypnotic. Let it lull you.

Be prepared
Lack of sleep, a lot of caffeine, and high doses of vitamin C taken before a dental appointment may interfere with the anesthetic's ability to numb the pain, making you even more anxious. Make sure you plan your day accordingly.

Seek help
Discuss your anxiety with the dentist before they get started. They may be able to increase the amount of anesthetic or offer a sedative to keep you calm. Many people find drug side effects unpleasant, though, so it's probably best to work through the issues instead of relying on medication. And if you need to seek counseling, don't be ashamed — you wouldn't be the first, and you may find it'll help calm your anxiety in many other areas of your life, too.

Take charge of your care
Brush and floss regularly, see your dentist as a matter of course, and let them know if you have an emergency. You'll find a little preventive care goes a long way.

WHAT CAN I DO TO KEEP MY TEETH HEALTHY?

Brush and Floss

As we've mentioned many times in this book, daily brushing and flossing are the first defense in keeping your mouth healthy. In addition, research has shown that fluoride, a mineral found naturally in all water sources, can reduce the number of cavities and help repair the early stages of tooth decay, even before the evidence is visible to a dentist.[19] Fluoride remineralizes areas of the teeth where bacterial acid has begun to eat away the surface. As a result, it not only reverses the early decay process, but it creates a tooth surface that's resistant to further decay.[20]

Topical fluorides are found in most kinds of toothpaste and mouth rinses, as well as in professionally applied therapies. When buying toothpaste, make sure it contains fluoride. You can tell that it does if it has the ADA seal of approval on the box. In addition, for about 50 years, many communities have added fluoride to their water supplies as a preventive measure.

Choose a soft-bristled toothbrush to avoid damaging the gums. Put a small amount of paste on the brush and then use the following steps:

Place the bristles along the gum line at a 45-degree angle, ensuring they contact both the teeth and the gums. Brush gently (no need to overdo it!), using a circular motion along all tooth surfaces, inner and outer (see Figure 3).

Tilt the brush vertically behind the front teeth, first the upper and then the lower (or vice versa). Make several up-and-down strokes using the front part of the brush.

Figure 3: Brush your teeth using a soft-bristled brush tilted at a 45-degree angle to the teeth and gums.

19 https://dph.illinois.gov/topics-services/prevention-wellness/oral-health/fast-facts-oral-health/fluoride-prevent-decay.html

20 https://my.clevelandclinic.org/health/treatments/11195-fluoride

Place the brush against the teeth's top (biting) surface, first the upper and then the lower. Use a gentle back-and-forth scrubbing motion, making sure you reach all the way to the back teeth.

Brush your tongue from back to front. Don't forget that the tongue, like the gums, harbors bacteria. It's important to remove them from here, as well.

To floss your teeth, use the following steps (see Figure 4):

Cut off about 18 inches of floss from the dispenser and wind it around the middle fingers of each hand. Pinch it between your thumbs and index fingers, leaving about one to two inches in between.

Use your thumbs to guide the floss between the upper teeth; use your index fingers to guide it between your lower teeth.

Use a zigzag motion when moving between the teeth, contouring the floss around the side of each separate tooth. Don't snap the floss into the gums since that can cause injury.

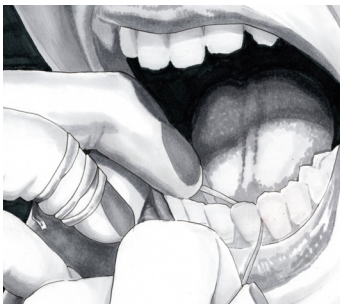

Figure 4: Use both your index fingers and your thumbs to hold the floss gently but securely as you move it up and down.

Slide the floss up and down the tooth surface and under the gum line, using a clean section of floss for each area. Also, make sure you floss the teeth in the back of the mouth, even if they're a bit awkward to reach. They need attention, too.

You should brush twice a day and floss at least once daily. Some people like to brush after every meal, while others prefer to do it when they wake up and right before bed. The key is to find what works for you and be consistent about it.

Use Mouth Rinses

Mouthwashes generally do little to help your teeth; the purpose of most mouthwashes is to "freshen your breath." On the other

hand, antiseptic mouth rinses are designed to help reduce the number of bacteria and amount of plaque, and fluoride rinses remineralize teeth. They can serve as good supplements to brushing and flossing. Talk to your dentist about whether a mouth rinse is right for you.

Eat a Balanced Diet

Good nutrition and a balanced diet are critical not just to overall health but to the health of your mouth, too. Think before you eat. Make sure you select foods from all the major food groups, limit your intake of sugary and starchy foods (it's not just cake and candy that contain sugars — items such as milk, pasta, and fruits do, as well) and between-meal snacks, and try to at least after each meal. If you're on a special diet, keep your doctor's advice in mind when deciding what to eat.

DOES DENTAL CARE AFFECT MY GENERAL HEALTH?

Proper dental care is not only essential to keep your teeth healthy, but it keeps the rest of your body healthy, as well — problems in the mouth can be the "canary in the coal mine," indicating other health problems.

The mouth contains bacteria. In people with healthy immune systems, it's pretty much harmless if these bacteria enter the bloodstream (such as through a cut in the gum). However, in people with immune systems weakened by disease or medical treatments, oral bacteria can cause infection in other parts of the body. For example, infective endocarditis may result when oral bacteria stick to the lining of damaged heart valves, causing further heart problems.

Health-Related Problems

Recent studies also point to associations between oral infections and a number of medical conditions, including diabetes, heart disease, and stroke. For now, there's not enough hard evidence to determine if oral infections cause these problems or if they simply occur alongside them. Regardless, an oral infection can indicate other, more serious issues.[21]

Research has also associated periodontal disease with many systemic health conditions, including heart disease, diabetes, respiratory disease, and Alzheimer's disease. Again, though, it hasn't proven a clear cause-and-effect relationship, as the diseases are multifactorial.[22]

We do know that mild periodontal disease affects 75 percent of adults in the United States, and more severe forms affect about 20 percent. When you also consider that infection and inflammation in one body region can easily affect other regions, it's reasonable to suppose there may at least be some relationship between periodontal health and overall health.[23]

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21 https://www.mayoclinic.org/healthy-lifestyle/adult-health/in-depth/dental/art-20047475

22 https://www.perio.org/for-patients/gum-disease-information/gum-disease-and-other-diseases/

23 https://www.nidcr.nih.gov/research/data-statistics/periodontal-disease/adults

Heart disease
Several studies have suggested that periodontal disease may increase the risk of heart disease because of inflammatory products such as c-reactive protein (CRP found in blood plasma). Patients with periodontal disease have elevated CRP levels, which may rise in response to inflammation in the body.

One possible explanation for elevated CRP is that the bacteria originating in infected gum tissue can enter the bloodstream and travel to other body regions, leading to inflammation and plaque in the blood vessels. Research published in 2010 found strong evidence supporting the relationship between oral bacteria and the development of atherosclerosis, a build-up of fatty plaque in the blood vessels commonly known as "hardening of the arteries."[24]

In addition, gum disease and heart disease share common risk factors, such as smoking and being overweight, which might explain why the two often coincide. A 2014 study found that treating periodontal disease can lessen the adverse effects of heart disease and other chronic conditions.[25]

Diabetes
People with diabetes are more likely to develop periodontal disease than people who don't have diabetes. This may be because their immune systems aren't as robust, impairing healing and making them more susceptible to contracting infections. In fact, periodontal disease can be seen as a complication of diabetes, with those who don't have their sugar levels under control at high risk.

Diabetics with severe periodontitis may have higher levels of HbA1C; this is a form of glucose-linked hemoglobin used to determine how well a person's blood sugar is under control. According to the ADA, the association between gum disease and diabetes goes both ways. Periodontitis can affect blood glucose levels, and people with diabetes may be more susceptible to infections of all kinds, including infections of the gingival tissues.[26]

24 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3084572/
25 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6486158/
26 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9954907/

A January 2017 study published in the journal *BMJ Open Diabetes Research and Care* found that about 1 in 5 people with periodontitis also had type 2 diabetes (insulin resistance) but didn't know it. The researchers suggested that semi-annual dental check-ups could provide an unexpected opportunity to screen people for prediabetes and diabetes.[27]

Respiratory disease
Research has suggested that the bacteria responsible for periodontal disease can be aspirated into the lungs, where they contribute to respiratory diseases such as pneumonia.[28]

Alzheimer's disease
Studies from the National Institute of Aging have shown some connection (but not a causal link) between the bacteria responsible for gum disease and the progression of Alzheimer's disease. Researchers suggest that bacteria may be able to migrate to the brain and contribute to the amyloid protein plaques characteristic of the disease.[29]

Take Charge of Your Care

Your teeth are your responsibility, and they can last you a lifetime with routine care. Talk to your dentist about what you can do to ensure that lifetime is long and healthy.

27 https://onlinelibrary.wiley.com/doi/10.1111/jcpe.13189

28 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6280567/

29 https://www.alz.org/co/news/oral-health-and-alzheimers-risk

ORGANIZATIONAL RESOURCES

Centers for Disease Control and Prevention
1600 Clifton Road Atlanta, GA 30329-4027
Phone: (800) 232-4636
Website: http://www.cdc.gov
National Institute of Dental & Craniofacial Research

National Institutes of Health
Telephone: (866) 232-4528
Email: nidcrinfo@mail.nih.gov
Website: http://www.nidcr.nih.gov

Sjögren's Syndrome Foundation, Inc.
10701 Parkridge Blvd. Suite 170, Reston, VA 20191
Phone: (301) 530-4420
Website: http://www.sjogrens.org

RESOURCES ON THE INTERNET

(Please note: All links were working at the time of publication. With the ever-changing environment of the internet, however, some pages may not be accessible at a later time.)

Academy of General Dentistry
General dental information
http://www.agd.org

American Academy of Periodontology
Extensive information on periodontal disease and treatments and a periodontal disease self-evaluation quiz
http://www.perio.org

American Dental Association
Extensive information on oral health topics, and a "find a dentist" search section
http://www.ada.org

National Institute of Dental and Craniofacial Research — National Institutes of Health
Oral Health Information Index, publications, statistics, research, clinical trials, news and reports, and the National Oral Health Information Clearinghouse and sections on special needs patients
http://www.nidcr.nih.gov

Sealants and fluoride treatments
https://www.cdc.gov/vitalsigns/dental-sealants/index.html
https://my.clevelandclinic.org/health/drugs/11195-fluoride

Laser dentistry
https://www.healthline.com/health/laser-dentistry
https://www.colgate.com/en-us/oral-health/dental-visits/all-about-dental-lasers

Dental anxiety
https://www.dentalproductsreport.com/dental/article/study-finds-more-60-percent-people-suffer-dental-fear
https://www.webmd.com/oral-health/sedation-dentistry-can-you-really-relax-in-the-dentists-chair#1
https://www.123dentist.com/best-practices-for-dealing-with-fear-when-you-are-scared-of-the-dentist/

Teeth whitening
https://gloscience.com
https://www.webmd.com/oral-health/teeth-whitening-and-bleaching#1
https://www.verywellhealth.com/how-is-professional-in-office-teeth-whitening-done-1059032
https://medlineplus.gov/ency/article/003065.htm

Veneers
https://www.webmd.com/oral-health/guide/veneers#1
https://www.medicalnewstoday.com/articles/dental-veneers#what-are-they

Tooth extraction
https://www.news-medical.net/health/Reasons-for-a-Dental-Extraction.aspx
https://www.mayoclinic.org/diseases-conditions/wisdom-teeth/symptoms-causes/syc-20373808

Partial and full dentures
https://www.ada.org/en/member-center/oral-health-topics/dentures
https://www.colgate.com/en-us/oral-health/dentures/adjusting-to-new-dentures-may-take-time
https://www.mayoclinic.org/denture-care/expert-answers/faq-20058375
https://www.gotoapro.org/facts-figures/

https://www.prosthodontics.org/assets/1/7/ACP_Talking_points_for_Missing_Teeth_1-12-15.pdf

Periodontal disease
https://www.webmd.com/oral-health/features/health-perils-of-gum-disease
https://www.everydayhealth.com/periodontal-disease/what-gum-disease-can-mean-your-overall-health/
https://www.perio.org/for-patients/gum-disease-information/gum-disease-and-other-diseases/
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3100856/
https://www.perio.org/for-patients/gum-disease-information/gum-disease-and-other-diseases/
https://drc.bmj.com/content/5/1/e000326
https://www.sciencedirect.com/science/article/pii/S0749379714001536

Dental Implants
https://www.health.harvard.edu/oral-health/two-options-for-replacing-lost-teeth
https://www.mayoclinic.org/tests-procedures/dental-implant-surgery/about/pac-20384622
https://www.webmd.com/oral-health/guide/dental-implants#1
https://www.guardiandirect.com/resources/articles/how-missing-teeth-can-hurt-your-oral-health
https://www.dentalimplantcostguide.com/how-long-do-implants-last/
https://www.mayoclinic.org/tests-procedures/dental-implant-surgery/about/pac-20384622
https://www.webmd.com/oral-health/guide/dental-implants#1
https://www.nobelbiocare.com/en-us/all-on-4-treatment-concept

Dental Emergencies
https://www.mouthhealthy.org/en/az-topics/d/dental-emergencies
https://www.yourdentistryguide.com/emergency/

GLOSSARY

Abscess: an infection at the tooth root tip that oozes pus
Amalgam: a metal-mercury compound used for filling teeth
Bridge: tooth restoration option that bridges gap where missing teeth
Canals: the conduits that run through the tooth's roots
Caries: cavities, or holes in the teeth
Cementum: the material that covers the tooth root
Crown: the visible portion of the tooth; may also refer to a manufactured crown used when tooth material has been lost
Dental anxiety: fear of going to the dentist that interferes with good oral hygiene practices
Dental implant: tooth restoration option that replaces the full tooth; uses a titanium post embedded in the jawbone
Dental sealant: a liquid material that hardens on the teeth and acts as a seal to prevent cavities, mostly in kids
Dentin: the soft, calcium-rich inner portion of the tooth
Denture: tooth replacement option that uses acrylic teeth bonded to an acrylic base; may replace a few or all teeth
Enamel: the hard covering around each tooth above the gum line
Endodontist: a dentist who specializes in problems with the pulp
Flap surgery: an invasive treatment for periodontal disease; surgical incisions used to gain access to tooth roots for cleaning
Fluoride: a mineral that helps make tooth enamel strong
Gingivitis: an early stage of gum disease
Halitosis: bad breath
Malocclusions: deviations from normal bite alignment
Oral surgeon: dentist who specializes in extractions, biopsies, and surgical procedures
Periodontal disease: the same thing as gum disease
Plaque: a sticky film formed by oral bacteria consuming sugars in mouth; can lead to caries
Pulp: the soft, inner material that contains connective tissue, blood vessels, and the nerve
Root canal: dental procedure to remove pulp and nerve from tooth canals when it becomes diseased
Scaling and root planing: dental procedure to remove plaque and tartar from teeth and gums
Tartar (calculus): hardened plaque; can get under gum line
Veneers: tooth restoration option that covers over minor cosmetic imperfections
Xerostomia: chronic dry mouth

ABOUT THE AUTHOR

Miriam Ruff is a freelance writer and editor with a degree in zoology (cell biology) and nearly 30 years of experience writing on various topics, including health care, the biological and physical sciences, and education. Her nonfiction work has appeared in scientific journals, newspapers, and books. She has also written and produced audio dramas and short films and continues to publish poetry and short stories. More important to this book, though, she's spent too much time in the dentist's chair and knows firsthand the importance of proper dental care.

ABOUT THE EXPERTS

(1st Edition Elham Amini, DDS, graduated from the University of Maryland School of Dentistry in 1994, with honors in endodontics, pediatric, and operative/restorative dentistry. She is a member of the Academy of General Dentistry, the ADA, the Maryland State Dental Association, and the Southern Maryland Dental Society. Her areas of expertise include general and restorative dentistry; children's care; oral surgery; periodontics; crowns, bridges, and dentures; and halitosis treatment. She is married, has one son, and has a thriving practice in Olney, Maryland.

(2nd Edition) Cyrus Allafi, DDS, received his bachelor's in biology at the Johns Hopkins University and his doctor of dental surgery rom the University of Maryland Dental School in Baltimore. He's a proud member of the ADA and the Maryland State Dental Association, and he's active in the Maryland Implant Society. He's also committed to lifelong learning, attending continuing education courses each year to stay on top of the latest dental techniques and materials available. His experience and training in topics such as implants, oral surgery, and prosthetics translate into advanced care at his practice in Silver Spring, Maryland.

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