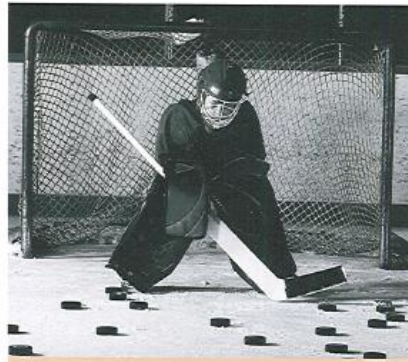


Wearing a mouth guard is required in many sports, such as football, basketball, boxing, lacrosse, and ice hockey. People who surf, skateboard, ride scooters, rodeo, or participate in gymnastics should also protect their teeth by wearing mouth guards.

Be careful not to burn your mouth when inserting the guard after heating it.

You can buy mouth guards in a store, or a dentist can make them specifically to fit your mouth. Stock mouth guards are available at sporting goods stores. To keep these in place, you have to clench your teeth, which may interfere with your breathing. "Boil-and-bite" mouth guards are made with moldable plastic that can be softened in warm water. The plastic then takes the shape of the teeth. To get the best fit and comfort, ask your dentist to make one from an impression of your teeth.

Usually, a mouth guard is worn on the upper teeth, but sometimes people may want one to cover the lower teeth, too, if they have braces. Whatever mouth guard you choose, be sure it fits well and that you are able to speak and breathe easily while wearing it.



Face protectors are absolutely necessary if you play a position in a sport that puts you directly in the line of something that can hurt your teeth or face. Baseball catchers and hockey goalies fall in that category.

Your Tooth Is Injured . . . Now What?

Injuries range from a tiny fracture in the enamel to broken and avulsed (knocked out) teeth. You might not see the fracture but will feel discomfort when chewing or if a sharp edge of the enamel irritates your lips or tongue. Seek treatment before the tooth is permanently damaged. If you experience sensitivity to changes in temperature, or find loose tooth fragments, call your dentist immediately. Treatment may include capping, bonding, root canal therapy, or extraction.

If you break your tooth, try to gather the broken pieces. Rinse your mouth with warm water. Take the pieces to the dentist, who will determine whether they can be bonded back onto the tooth. If swelling occurs, apply a cold compress to the face at the swollen area.

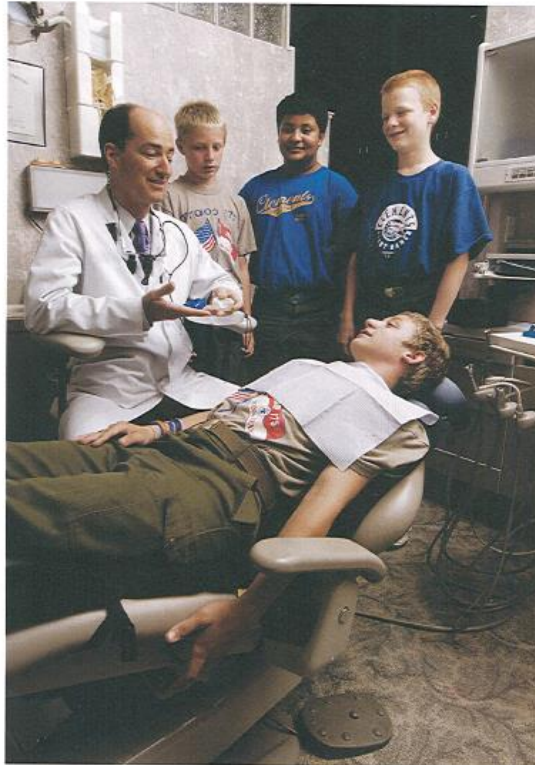
An avulsed tooth can be successfully replanted in the socket if you act fast. The first 30 minutes after the tooth is knocked out are critical. Hold it by the crown—not by the roots as you may destroy any surrounding tissue. Rinse it in milk, if available, or hold the tooth under cold running water, and get to a dentist immediately.



The main reason a replanted adult tooth might be lost is due to root resorption. This happens when the body rejects the roots and absorbs them over time. It is important that the dentist take an X-ray film of the tooth at least six months after it has been replanted to make sure that the roots are still intact.

If you can't replant the tooth, carry it to the dentist under your tongue or between your cheek and gum. If you are worried about swallowing the tooth, cover it with milk in a container or roll it up in a wet towel. *Do not allow the tooth to dry.* Go directly to the dentist—and don't forget the tooth!

If a permanent tooth gets knocked out, the trauma may cause damage to the nerves and blood supply, and even the alveolar bone. Often, the pulp dies. A dentist can determine whether root canal therapy will be necessary. If a primary tooth gets knocked out, the dentist may decide to insert a space maintainer to keep the teeth on either side of the space from moving together before the permanent tooth erupts.



At the Dentist's Office

Making a trip to the dentist is the best way to pinpoint problems in your mouth. Don't wait until you feel pain to schedule an appointment, and don't worry—visiting the dentist regularly is a gift you can give your mouth!

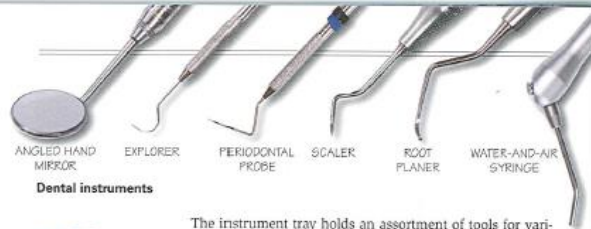
Equipment and Materials

A dentist's office is full of interesting tools, equipment, and supplies that are used to help keep teeth healthy. The dental unit, which may be freestanding or attached to the examining chair, holds various pieces of equipment: an adjustable overhead spotlight, which directs a high-intensity beam on the mouth; a saliva ejector, or small suction pump placed in the mouth to keep it dry during treatment; air hoses for low-speed and high-speed rotary hand pieces or drills; and an instrument tray.

Other equipment includes an autoclave for sterilizing instruments, an X-ray machine, and an ultrasonic cleaning machine, which emits high-speed sound waves that vibrate the tartar deposits off the teeth.



This ultrasonic cleaner sterilizes dental instruments.



ANGLED HAND MIRROR EXPLORER PERIODONTAL PROBE SCALER ROOT PLANER WATER-AND-AIR SYRINGE

Dental instruments



The instrument tray holds an assortment of tools for various tasks. The *angled hand mirror* helps the dentist examine hard-to-see tooth surfaces. The *explorer* is a metal probe with a curved, pointed end that is used to poke around in crevices and cavities. The *periodontal probe* has a straight tip marked like a ruler and is used to measure the depth of "pockets," or spaces where the gum has pulled away from the teeth. A *scaler* is a narrow-bladed instrument for scraping plaque and tartar off the crown; a *root planer* scrapes the buildup off the roots. A *water-and-air syringe* is for flushing debris that has just been scraped off the teeth and for cooling down the teeth during drilling.

Some other tools include tweezers, a polisher, hypodermic syringes for injecting anesthetic, and high- and low-speed rotary hand pieces with their attachments: drilling and grinding burs, and cleaning heads.

Rotary tools

Dental materials include dental floss, polishing pastes, filling materials for cavities, gauze squares, fluoride varnishes, sealants, and substances for making dental impressions and artificial teeth. Certain dental supplies, such as disposable gloves and surgical masks, are used to prevent and control the spread of infection.



The Examination

The main purpose of dental care is the prevention of tooth decay, gum disease, and disorders affecting oral health. Because decay and disease get worse if left untreated, you should get your teeth cleaned and examined every six months. To prevent dental and medical complications that can result from certain procedures, the dentist must know your medical history, especially whether you have conditions such as asthma, allergies, immune system problems, or infectious diseases.



During the examination, the dentist will inspect the teeth, gums, and tissues of the mouth. Your dentist is looking for evidence of not only decay and disease but also problems with the teeth and jaws aligning correctly. Because much of this information can't be determined just by looking in your mouth, the dentist depends on X-ray films, or dental radiographs, to detect damage and abnormalities early in their development.



The Radiograph

The X-ray is a form of electromagnetic radiation that can penetrate bone and soft tissues. Dense tissues like teeth and bone absorb more radiation than soft tissues like cheeks and gingiva. These substances cast shadows on the film when the X-ray penetrates them. Teeth and bone will cast more of a shadow than gums, but they will appear lighter because the film image is a negative. Cavities, abscesses, and bone loss appear darker than normal. Metal crowns and fillings look like white patches on the film.



View from a bitewing radiograph



Radiographs are taken inside and outside the mouth, depending on what views are required. The *bitewing films*, taken inside the mouth, show only the crowns and parts of the roots of two or three pairs of opposing upper and lower teeth. These radiographs reveal decay between adjacent teeth and under restorations (materials that replace tooth structure and function), bone loss from periodontal disease, and ill-fitting fillings. Bitewing radiographs are typically taken at 12-month intervals.



Digital bitewing

Dentistry Goes Digital

Many dentists now use digital radiography instead of the traditional film-based X-ray for capturing radiographic images of a patient's mouth. Doing so allows dentists to obtain a more extensive view, in less time, and with more flexibility for storing and sharing information.

The *periapical films*, also taken inside the mouth, show the entire tooth, from the crown to the root and including some of the periapical bone, which surrounds the root tips. These radiographs indicate the condition of the root and bone; missing, *impacted* (teeth that haven't erupted and remain fully or partly in the bone), or fractured teeth; and cysts, tumors, and abscesses.



On this panoramic X-ray, tooth decay and abscesses show up as darker patches.

A *full-mouth survey* is a combination of 14 or more periapical and bitewing films showing all the teeth (crowns and roots) as well as all the surrounding alveolar bone. This set of films is taken as needed for a specific diagnosis, or at intervals of about every three to five years.

The *occlusal radiograph* is another film taken inside the mouth. It shows the full arch of the bite, from an upper or lower view, and is useful for locating abscesses; other problems in the jawbone, such as extra, unerupted teeth; and stones in the salivary gland ducts. Most people don't need this kind of radiograph except for special instances.

The *panoramic radiograph* is a wide view that shows all structures in the lower half of the face: upper and lower jaws, sinuses, and cheek bones. Dentists use it to evaluate the general condition of the mouth and to detect jaw fractures, possible tumors, missing teeth, third molars, and "hidden" impacted teeth. This radiograph is taken outside the mouth.

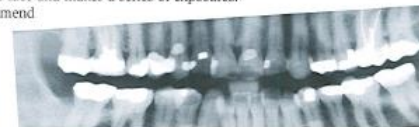
A special X-ray machine automatically moves in a semicircle around the face and makes a series of exposures. Many dentists recommend making this kind of radiograph every five years.



Full-mouth survey

Occlusal radiograph

Panoramic radiograph



Some people worry about their exposure to radiation when X-ray films are made. When carefully used, X-rays are not dangerous; however, dentists take certain precautions to reduce the risk and the exposure. They use high-speed film, timers, and filters to reduce the exposure time and eliminate unnecessary radiation. They also cover the patient with a lead apron during the X-ray procedure to protect the body, particularly the reproductive organs, from exposure. This apron should have a thyroid collar to protect the thyroid gland, which easily absorbs radiation. Dentists also follow recommended guidelines about how often to make X-ray films. Finally, more and more dentists are using *digital radiography*, which greatly reduces the exposure to radiation.



The Dental Model

After the dentist examines the mouth and studies the radiographs, he or she may decide to make a three-dimensional model of the teeth and jaws. This record is important for determining the exact position of the teeth and the relationship between the jaws, particularly if orthodontics (such as braces) or extensive prosthodontic repairs (such as dentures) are necessary.



First, an impression tray that fits the contour of the dental arch is filled with a sticky impression material that is much like modeling clay.

Then the tray is pressed over the teeth of one jaw and the material is allowed to set for a few minutes until it gets firm. The tray is removed, and the process is repeated for the other jaw.

Later, a dental technician will cast models of the jaws by pouring dental stone into the impressions, or molds, and letting it harden.

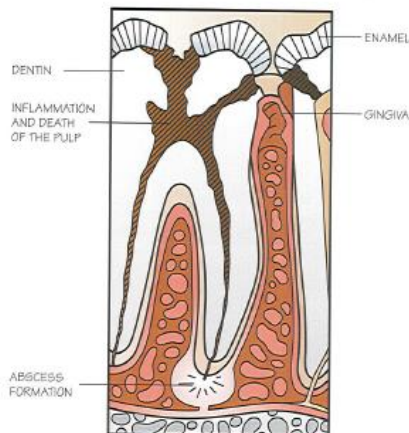
Then the models are mounted on an *articulator*, a hinged device that allows the dentist to open and close the jaws and study the bite, or *occlusion*.

Checking for Decay

To check for decay, the dentist uses a small mirror and explorer to examine the crown of each tooth. When the probe is poked into the chewing surface, it will stick or be difficult to remove if caries is present. A white spot on the tooth indicates that *decalcification* (softening of the enamel due to loss of calcium salts) has begun. A cavity, or hole, is a sign that decay has destroyed the enamel and penetrated the dentin.

Decay and cavities tend to occur in specific areas of the teeth where food and bacteria are easily trapped: in grooves and fissures on the molars and bicuspids; on the surfaces between adjacent teeth (called *proximal surfaces*), especially where one tooth touches another; and in the *sulcus*, the V-shaped depression inside the cuff of gum tissue that forms around the base of the crown.

More and more dentists are using a laser procedure that gives a digital reading of the progression of decay and can detect it at a very early stage. Early detection of decay through new dental technologies can help save teeth.



Left unchecked, a small cavity can expand into the root of the tooth.

Checking for Gum Disease

In the past, tooth decay was the main reason people lost their teeth. But today, because fluoridation has helped prevent decay, the number one reason for tooth loss in adults younger than 30 is periodontal disease. Genetic factors are the leading cause of periodontal diseases, but other factors can increase the risk. Medical conditions such as diabetes or HIV, smoking or chewing tobacco, poor nutrition, impacted teeth, and ill-fitting restorations can make you more vulnerable to periodontal disease.

The dentist can often tell by a visual examination of the mouth whether you have periodontal disease, but he or she also depends on X-ray films of bone loss and a probing assessment to determine the degree of activity or severity. With a periodontal probe (manual or automated), the dentist will test the gums for attachment, depth of the sulcus or pocket, tooth mobility, bleeding, and bone destruction.



Badly diseased gums

If you have any of these symptoms of periodontal disease, see your dentist:

1. Gums that bleed when you brush your teeth
2. Gums that are tender, swollen, or red
3. Gums that no longer adhere to the teeth
4. Persistent bad breath
5. Pus in the gingival crevice
6. Loose teeth
7. A change in your bite
8. A change in the way your partial dentures fit

There are four stages of periodontal disease.



Gingivitis



Advanced periodontitis

- The first stage is **gingivitis**, the inflammation of the gums. Diligent oral hygiene and routine professional cleaning can improve the symptoms and heal the gums.
- The second stage is **early periodontitis**. The tissue lining the sulcus becomes inflamed and swollen; the sulcus deepens, providing a perfect place for bacteria to multiply; and damage to the tissue extends as far as the alveolar bone.
- In the third stage, **moderate periodontitis**, the pockets deepen even more, harmful bacteria thrive, the periodontal ligament and alveolar bone are inflamed, and bone dissolves.
- In the fourth stage, **advanced periodontitis**, bone loss is so severe that the tooth is loose in its socket and eventually will fall out.

Treatment varies depending on the stage of the disease, from simple tartar scraping and tooth polishing, to removal of damaged tissue with a spoon-shaped instrument, to scraping and planing (smoothing) the tooth root, to laser treatment, to gum surgery. The dentist will sometimes refer a patient with periodontitis to a specialist called a *periodontist*.

Checking for Oral Cancer

Of all the places in the body where cancer occurs, the mouth is the seventh most frequent. Certain oral cancers, such as cancer of the tongue, are deadlier than colon cancer, breast cancer, or Hodgkin's disease. The main victims of oral cancer are smokers, former smokers, chewing tobacco users, and heavy drinkers of alcohol. Survival rates improve dramatically if the oral cancer is detected and treated early.

The most common place for the cancer to develop is on the lips (particularly the lower lip). This is often the result of regular exposure to the sun and mostly affects light-complexioned people. Other areas of oral cancer, in order of frequency, are the sides and back two-thirds of the tongue, floor of the mouth, gingiva, roof of the mouth, and insides of the cheeks.

Cancers of the tongue and floor of the mouth are quite deadly because they often spread (*metastasize*) to the lymph nodes and then to other parts of the body. The opposite happens, too; sometimes cancer in other parts of the body spreads to the mouth and causes tumors.

You should pay attention to the following warning signs and let your dentist know if you have any of these symptoms:

1. A sore in or around the mouth and neck areas that does not heal within two weeks
2. Unexplained bleeding in the mouth
3. Numbness or loss of feeling in any part of the mouth
4. Unexplained pain or soreness in the mouth
5. Swelling on the lips, tongue, roof of the mouth, or neck
6. Difficulty chewing or swallowing food
7. A lump or thickening in your cheek that you can feel with your tongue
8. A white or red patch on your tongue, gums, or soft tissues in the mouth



If the dentist suspects cancer, the dentist or an oral surgeon will perform a screening procedure called a *biopsy*, which is the surgical removal of a tissue specimen to determine what kinds of cells are present. An oral pathologist will examine the tissue under a microscope and report the findings to the dentist or oral surgeon. If the cells are cancerous, then the treatment may require extensive surgery and/or chemotherapy or radiation therapy. If surgery is necessary, an oral surgeon may remove part of the jaw, tongue, or roof of the mouth.

Cancer treatments (especially radiation and chemotherapy) reduce the body's ability to fight infection. In some cases, the bone tissue in the jaw is destroyed. The dentist will take steps to reduce that risk by treating tooth and gum problems *before* radiation therapy. One serious side effect of radiation of the head or neck is damage to the salivary glands. If the glands are destroyed, the mouth dries out, swallowing becomes difficult, and tooth decay sets in.

Blood, Sweat, Tears . . . and Spit?

Our bodily fluids can say a lot about us: a high white blood cell count can indicate infection; lack of sweat on a very hot day can signal heatstroke; tears can help flush an object from the eye. But what can saliva tell us about the body's general health? More than you might think.

Saliva improves the taste of your food. The body just can't taste food that is dry. Saliva provides a natural lubricant that brings out the cheese in your macaroni, and yes, even the Brussels in your sprouts.

Saliva protects your mouth and teeth. By providing a protective layer between your mouth and the food you eat, saliva can help maintain healthy cells inside your mouth. It allows tooth-damaging food particles to float away, helping protect your pearly whites from decay. Also, the pH of saliva closely resembles that of your teeth, so it helps maintain the mouth's acidity and protects teeth from decay.

Saliva helps in digestion. You might not be thinking about digestion at the dinner table, but as soon as you take a bite, the saliva in your mouth is getting to work. The mucus in saliva helps bind food and make its trip to the stomach easier.

Saliva improves your speech. The natural lubricant that saliva supplies to your mouth helps keep you from getting tongue-tied.

Saliva helps keeps your breath fresh. Saliva contains a natural enzyme that slows bacteria production. When you sleep, the body produces less saliva, so bacteria—and the smells that go with it—are free to build up in your mouth. And you wondered where you get that morning dragon breath!

Scientists have developed many tests using human saliva to diagnose various illnesses, including certain cancers and viruses. Dentists use saliva tests to check a patient's susceptibility to caries.

Treating Teeth

If caries has not penetrated the enamel, the dentist may apply a plastic "pit-and-fissure" sealant to prevent bacteria from attacking the enamel on a bicuspid or molar. He or she may also paint fluoride on the smooth surface of the tooth, with repeated topical applications over time, in the hopes that the enamel will remineralize.

Decayed and Broken Teeth

If caries has penetrated the dentin and created a cavity, the dentist will remove the decay and insert a filling. If the damage is extensive and the tooth is brittle, he or she will restore the tooth with an artificial crown. Once decay has reached the pulp, the dentist or a specialist (an *endodontist*) will perform root canal therapy to remove the pulp and save the tooth. As a last resort, the dentist will take out the tooth.

If the tooth structure is still sound, the dentist will fill the cavity with one of several materials: silver amalgam, gold, composite, glass ionomers, or porcelain. The choice depends on various factors such as the location of the infected or broken tooth, the size of the decayed area, the strength of the filling material, aesthetic concerns, and cost.

Silver Amalgam. Silver amalgam is a mixture, or *amalgam*, of silver, mercury, and trace metals. Dentists have used it for more than a century to fill cavities in the grinding and chewing surfaces of molars and premolars. Because of the filling's dark color, dentists prefer to use it in the inconspicuous back teeth and not on the front teeth. If properly formed, silver amalgam will completely seal the cavity. It is strong and durable, easy to insert in one office visit, cost-effective, and biocompatible—that is, it won't irritate the living tissues in the teeth and gums.



Decayed tooth



Tooth with an artificial crown



Teeth filled with silver amalgam

Silver amalgam has some disadvantages. It is brittle and requires adequate tooth support to hold it in place and keep it from getting chipped or shattered. Unlike the other kinds of fillings, silver amalgam is not attached or cemented to the tooth, although sometimes the two may be "bonded." The cavity is undercut to lock in the filling when it hardens. Sometimes the filling becomes loose and falls out, or expands, causing the tooth to crack. The amalgam may leak at its margins (where the metal meets the tooth) and discolor the gums or enamel.

Gold (Foins, Inlays, and Onlays). If decay has destroyed large areas of the tooth, the dentist may recommend a gold filling, which is stronger than silver amalgam. Unlike the silver filling, gold is not brittle and can actually strengthen the tooth structure. It is lighter in color than silver amalgam and does not stain the enamel. However, gold does look artificial on visible tooth surfaces and is much more expensive than other filling materials.

Most solid gold fillings—called *inlays* or *onlays*—are cast from a mold of the cavity and cemented in place. These aren't really fillings because they are made in a dental laboratory. An inlay is set between the walls of tooth structure, but like a wedge, it can split the tooth if too much pressure is exerted to force it into position. With an onlay, gold "lays over" the natural cusps of the tooth, which have been cut down, and forms a protective bond.

Inlays, onlays, and crowns are also used to restore broken or fractured teeth. Unlike the inlay or onlay, which holds the tooth together from the inside, the crown completely or partially covers the tooth and holds it in place from the outside. If part of the tooth is broken off and the remaining structure can't support a filling, inlay, or onlay, then the dentist will "cap" the tooth with a crown.

The cast gold fillings, particularly the onlay, are very effective but quite expensive. They also require two or three office visits before the filling can finally be inserted. Between appointments, the patient must wear a temporary filling to protect the cavity from contamination and fracture. Although gold offers a better restoration than other filling materials, many patients decide against it because of the expense, the inconvenience, and its unnatural look on the teeth.



Before composites

After composites

Composite techniques are difficult, and certain procedures must be followed so that the composites will work. For instance, it is very important to keep saliva or blood off the tooth once it has been readied for bonding. Dentists often say that placing composites is "technique-sensitive." That means that every step must be done with great care for a good final result. If composites are not done properly, leakage, tooth pain, damage to the nerve, and new decay may result.

Composite. Composite is a mixture of plastic resin and fine reinforcing particles that is naturally white and can be shaded to match the color of a tooth. With recent developments, these tooth-colored fillings can last about as long as metal ones. The composite adheres to the surface of the tooth, so it can be painted on a discolored tooth or bonded to malformed or misshapen teeth. This allows the dentist to radically improve upon appearance of a damaged tooth and also make it stronger by bonding it together.

Anyone may have unusual sensitivity to any dental materials, so dentists may have to experiment to find out what works best for an individual patient.

Porcelain. Porcelain is a ceramic material that, like the composite, can be colored to match the color of the natural teeth and is suitable as a filling and as a crown on visible surfaces. Because of its durability, longevity, and resistance to staining, porcelain is superior to composite; however, it is more brittle than gold or silver amalgam. Like gold fillings, it requires several office visits and is, therefore, more expensive than the amalgam or composite materials.



Before porcelain



After porcelain

Missing Teeth

The main cause of tooth loss is periodontal disease, but dental caries, injury, congenital problems (problems that exist since birth), and tumors can all damage the tissues in the mouth and contribute to this serious condition. Missing teeth should be replaced immediately, except for the third molars, or wisdom teeth. It isn't necessary to replace primary teeth, but the spaces must be maintained so the permanent teeth can erupt in the proper alignment.

Most people are eager to replace missing teeth to improve their appearance, but there are more critical reasons for replacing them: to restore chewing function and fix a bad bite, to prevent damage to the remaining teeth, to prevent adjacent teeth from drifting into the spaces and getting out of alignment, to support the muscles that control facial expressions, and to prevent alveolar bone loss. These factors can lead to total tooth loss, which can actually cause the face to collapse.



The dentist, or a specialist called a *prosthodontist*, will decide what kind of treatment is required on the basis of how many teeth are missing and how healthy the adjacent teeth and gums are. A fixed partial denture, or *bridge*, is used to replace one or more missing teeth as long as there are healthy teeth on either side of the space. The good teeth are crowned to support and connect the artificial tooth.

If some of the adjacent teeth are not strong enough to support the bridge, then the dentist will make a removable partial denture, which depends in part on support from the gums and bones of the jaw. If all the teeth are missing in a dental arch, a full removable denture is necessary.

Complete dentures—substitutes for natural teeth—have their drawbacks. People sometimes complain that chewing is more difficult, that the dentures don't fit properly and make clicking noises when they talk or eat, and that wearing them makes them gag. So do your best to keep your own teeth.

Dental *implants* are another way to deal with missing teeth. Titanium anchors inserted into the jawbone act as artificial replacements for tooth roots. Then, a bridge, denture, or tooth is attached to the implant.

Implants can be a good idea no matter how many teeth are missing—from just one tooth, to all the teeth. They can replace missing teeth if the bone is healthy, thereby helping to keep the teeth on either side healthy, too. They are also used when all the teeth are missing to help give full dentures more stability. Implants are a popular option because they do not damage adjacent teeth.

George Washington had lost all but one tooth by the time he became president. He wore several sets of false teeth, but they were never made of wood, as we commonly hear. His dentures were fashioned from gold, hippopotamus ivory, elephant ivory, walrus ivory, cattle teeth, and human teeth.

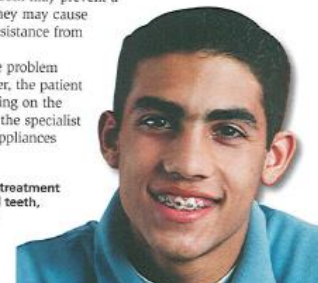


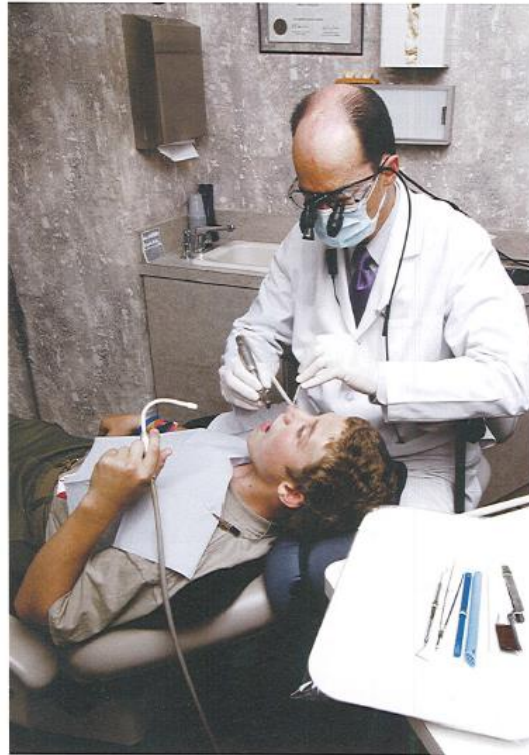
Misaligned Teeth

Teeth that are crowded or crooked are difficult to clean, which makes them prone to tooth decay and gum disease. Missing teeth, misaligned teeth, and abnormal jaw structure affect the way the teeth in both jaws meet, or *occlude*. Malocclusion is a bad bite. It can cause the teeth to wear down unevenly. It may place stress on the tissues, bones, and joints in the face, causing pain or damage. Misaligned teeth may prevent a tooth from erupting (impaction), or they may cause one to grow out too far (for lack of resistance from an opposing tooth).

Sometimes the dentist can fix the problem by extracting a tooth. Usually, however, the patient is referred to an *orthodontist*. Depending on the degree of tooth movement necessary, the specialist will recommend fixed or removable appliances such as braces and retainers.

Orthodontists prescribe braces for the treatment of problems like crooked or misaligned teeth, buck teeth, and overbite or underbite.





Careers in Dentistry

The dentist you routinely see for checkups, cavity fillings, tooth extractions, and cleaning is the *general dentist*. He or she is trained to care for the teeth, mouth, and jaws and can recognize and treat conditions that affect not only the mouth and supporting structure but also the rest of the body. The primary focus of a general dentist is operative dentistry, which is concerned with fixing, repairing, or restoring teeth. The general dentist is licensed to prescribe certain drugs and to administer anesthetics. Often, the dentist is the first doctor to diagnose oral cancer or AIDS.

If someone requires special treatment such as braces, dental implants, or complicated root canal therapy, the dentist may refer that person to a specialist who has extra training for that treatment.

Specialties in Dentistry

The American Dental Association recognizes nine dental specialties. Each focuses on a specific type of dental treatment or kind of patient. Specialists who have met the educational requirements for that specialty can choose to limit their practices to their specialty, or they can also perform general dentistry. However, general dentists who practice a specialty may not limit their practices to that specialty.

Dental Public Health

Public health dentists focus on the prevention and control of dental diseases on national and international levels and promote oral health care through educational programs in communities and institutions. They generally work for government agencies such as the United States Public Health Service, the military, hospitals, and universities. Dentists in this specialty study trends in dental disease and related disorders and report this information to other dentists and to the general public. A specialist in dental public health must earn an advanced degree and complete a dental public health residency.

Endodontics

An endodontist cares for the inner parts of the teeth. This specialist is concerned with the prevention, diagnosis, and treatment of disorders of the dental pulp and tissues surrounding the root of the tooth. The endodontist is an expert in pulp capping, root canal therapy, surgical procedures such as root amputation, and bleaching (for teeth discolored as a result of pulp damage).

Oral Pathology

The oral pathologist studies tissues from the mouth and teeth and diagnoses oral diseases such as tumors and cancers. He or she is a resource person, or consultant, for general dentists and specialists. Although some oral pathologists treat patients referred by general dentists, most work in research environments in laboratories, hospitals, and dental schools.

Oral and Maxillofacial Surgery

This specialty involves the diagnosis and surgical treatment of diseases, injuries, and birth defects affecting the mouth, face, jaws, and neck. The oral surgeon performs complicated tooth extractions (for example, impacted third molars) and biopsies; reconstructs cleft lips, cleft palates, and malformations of the facial bones; and replaces teeth with dental implants. He or she is trained to administer sedatives and anesthetics that most dentists are not permitted to prescribe.

Oral and Maxillofacial Radiology

This newly recognized specialty provides advanced imaging for patients who have complex problems. The general dentist (or other specialist) usually provides the patient with radiographic services. However, a patient may sometimes need advanced imaging techniques that require sophisticated and expensive equipment. Like oral pathologists, oral and maxillofacial radiologists may examine patients referred to them by other dentists or by physicians. Many of these specialists work in institutional settings such as dental schools, where they teach and also conduct research.



Orthodontics—
before and after

**Orthodontics and Dentofacial Orthopedics**

An orthodontist corrects malocclusions (bad bites) and straightens crooked teeth, crowded teeth, and buckteeth. This specialist uses fixed appliances such as braces to slowly reposition teeth and removable devices to change the structure of the jaws or keep teeth in place (with a retainer).

Pediatric Dentistry

In general, a pediatric dentist is one who treats children and teenagers, although some also care for mentally and physically challenged adults. Pediatric dentists study the growth and development of children's facial structure and teeth, and they are trained in easing the fears of children who are afraid of going to the dentist.

Periodontics

Periodontics is the specialty concerned with tissues around the teeth—the gingiva and supporting bone. The periodontist prevents, diagnoses, and treats the gum disease caused by plaque, and uses nonsurgical treatments such as scaling, root planing, and medication application to reduce the quantity of harmful bacteria and smooth the surface of the root (to slow the rate of bacterial regrowth). Periodontist also perform surgical procedures to remove gum tissues and eliminate pockets, which trap food and the bacterial plaque. Additionally, they often place implants to restore missing bone and teeth.



Prosthodontics—before and after

Prosthodontics

The purpose of this specialty is to replace all or parts of damaged or missing teeth in order to restore the normal chewing function of teeth and to improve the occlusion, or bite; to prevent further damage; and to improve appearance. Prosthodontists design, make, and fit inlays, crowns, bridges, partial and full dentures, and implants.

Maxillofacial prosthodontists work with oral surgeons to replace lost parts of the face (such as noses).

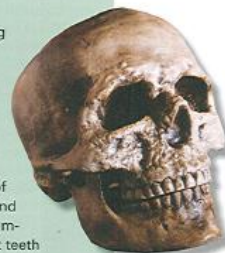


Tooth Sleuths

All humans have a set of mystery-solving clues right under their nose. Just like DNA evidence or fingerprints, the arrangement of a person's teeth can be useful in *dental forensics*—the science of identifying disaster and crime victims, and even the suspects, from evidence found in the mouth.

As the hardest, most durable parts of the body, human teeth can often withstand a major impact or fire without a lot of damage. And although cavities are proof that teeth can decay, they do not decompose as quickly as the rest of the body. By comparing a set of teeth to existing dental X-rays, scientists can be positive if the two are a match, which can mean closure to a grieving family trying to identify the remains of loved ones killed in a plane crash or other disaster. When dental records are not available, scientists can compare digital photographs of the teeth to a picture of the smiling person. In fact, three-dimensional computer technology can even reconstruct a person's facial features based just on skeletal remains.

Before forensic dentistry was introduced, identifying disaster victims could be done by DNA testing—which could take up to six weeks. Now it can be almost immediate, and it can get even faster. The FBI is developing a national dental identification database that can compare thousands of dental records and return possible matches, much like the Automated Fingerprint Identification Systems that many police and government agencies use. Using quick identification techniques made possible by forensic dentistry can have positive applications in the real world. For example, matching bite marks on a victim's body to a suspect's teeth can help put criminals behind bars.



Dental identification is not new to the United States. During the Revolutionary War, for example, Paul Revere was able to identify a colonel who was killed in battle by the ivory and wire bridge Revere had made for him.

Dental Auxiliaries

It takes a team to care for your mouth. After you, the general dentist has the overall responsibility for your oral health. But dentists also depend on several other people to help with diagnosis and treatment.



Dental hygienist

Dental Hygienist

The dental hygienist, a specially trained and licensed dental nurse, provides the most important preventive maintenance services: dental prophylaxis (teeth cleaning), application of topical fluorides and sealants, and oral examination for decay and periodontal disease. The hygienist takes radiographs, records case histories, charts dental conditions, and teaches patients how to properly brush and floss at home.

A minimum of two years of college in an accredited dental hygiene program is required to become a registered dental hygienist. Before getting licensed, however, the hygienist must pass state and national board exams.



Dental assistant

Dental Assistant

The dental assistant helps the dentist work quickly and efficiently. He or she sterilizes instruments, mixes filling materials, rinses debris out of the patient's mouth, and hands tools to the dentist. The training requirements and responsibilities of this position vary by state. A certified dental assistant (CDA) has completed a one-year ADA-approved training program.

Dental Technician

The dental technician is the person on the dentist's team who creates artificial teeth and sets of dentures. These detail-oriented professionals use their artistic talents in working with metal, dental porcelain and acrylics, and even computer-aided design to make dental implants that perfectly fit each patient. They work directly with dentists and orthodontists and have little patient contact.

Education and Cost of Training

The basic training for dentists is four years of dental school after graduation from college. Upon successful completion of dental school requirements, the graduate is awarded a doctor of dental surgery (D.D.S.) or a doctor of dental medicine (D.M.D.) degree. To practice, he or she must pass both a written national board and a state or regional examination. After passing the boards, the dental school graduate may apply to the state board of dentistry for a license to practice general dentistry. Some people go right into practice; others may enter a one- or two-year residency program in general dentistry; and still others may choose to train for one of the dental specialties.

A minimum of two years of postgraduate training in a program sponsored by a dental school or hospital is required to become a dental specialist. After successfully completing the requirements, the dentist is "board eligible." If he or she passes the board for that specialty, then he or she becomes "board certified." Certificates, not degrees, are awarded for advanced study.

The sponsoring institution may decide whether the dentist must pay for his or her advanced training, or whether he or she should receive a stipend (allowance). It is common practice to offer paid residency programs in hospitals in the areas of pedodontics, oral surgery, and general dentistry. Postgraduate training in dental schools for the other specialties usually require tuition. When you consider that a dental specialist has trained for six or more years after college, you will realize what an extraordinary commitment that person has made in terms of time and money.

Slaves in ancient Rome had to clean and polish their masters' teeth. They picked tartar off with sharpened sticks and then rubbed on powders made from burned lizard livers and honey or urine to make them shine. Little did these slaves know that they were blazing a trail for dental hygienists.



Dentistry Resources

Scouting Literature

First Aid, Medicine, and Public Health merit badge pamphlets

For more information about or to order Scouting-related resources, visit the BSA's online retail catalog at <http://www.scoutstuff.org>.

Books

Betancourt, Jeanne. *Smile!*

How to Cope with Your Braces. Alfred A. Knopf, 1982.

Ichord, Loretta Frances. *Toothworms and Spider Juice: An Illustrated History of Dentistry.* The Millbrook Press, 2000.

Klatell, Jack, Andrew Kaplan, and Gray Williams Jr. *The Mount Sinai Medical Center Family Guide to Dental Health.* Macmillan Publishing Company, 1991.

Lee, McHenry, Joleen Jackson, and Vicki J. Audette. *I Hate Dentists! The Feel Good Guide to Going to the Dentist.* IHD Publishing, 1999.

Marsoli, Lisa Ann. *Things to Know About Going to the Dentist.* Silver Burdett Company, 1984.

Moss, Stephen J. *Your Child's Teeth: A Parent's Guide to Making and Keeping Them Perfect.* Houghton Mifflin Company, 1977.

Ring, Malvin. *Dentistry: An Illustrated History.* Harry N. Abrams Inc., 1985.

Silverstein, Alvin, and Virginia B. Silverstein. *So You're Getting Braces: A Guide to Orthodontics.* J. B. Lippincott Company, 1978.

Smith, Rebecca W., and the Columbia University School of Dental and Oral Surgery. *The Columbia University School of Dental and Oral Surgery's Guide to Family Dental Care.* W. W. Norton & Company, 1997.

Taintor, Jerry F., and Mary Jane Taintor. *The Oral Report: The Consumer's Common Sense Guide to Better Dental Care.* Facts On File Publications, 1988.

Ward, Brian R. *Dental Care.* Franklin Watts, 1986.

Wynbrandt, James. *The Excruciating History of Dentistry: Toothsome Tales and Oral Oddities From Babylon to Braces.* St. Martin's Press, 1998.

Organizations and Web Sites

Academy of General Dentistry

211 E. Chicago Ave., Suite 900
Chicago, IL 60611-1999
Toll-free telephone: 888-243-3368
Web site: <http://www.agd.org>

American Academy of Oral and Maxillofacial Pathology

214 N. Hale St.
Wheaton, IL 60187
Toll-free telephone: 888-552-2667
Web site: <http://www.aaomp.org>

American Academy of Oral and Maxillofacial Radiology

P.O. Box 1010
Evans, GA 30809-1010
Telephone: 706-721-2607
Web site: <http://www.aaomr.org>

American Academy of

Pediatric Dentistry

211 E. Chicago Ave., Suite 700
Chicago, IL 60611-2663
Telephone: 312-337-2169
Web site: <http://www.aapd.org>

American Academy

of Periodontology

737 N. Michigan Ave., Suite 800
Chicago, IL 60611-6660
Telephone: 312-787-5518
Web site: <http://www.perio.org>

American Association

of Endodontists

211 E. Chicago Ave., Suite 1100
Chicago, IL 60611-2691
Toll-free telephone: 800-872-3636
Web site: <http://www.aae.org>

American Association of Oral and Maxillofacial Surgeons

9700 W. Bryn Mawr Ave.
Rosemont, IL 60018-5701
Telephone: 847-678-6200
Web site: <http://www.aaoms.org>

American Association of Orthodontists

401 N. Lindbergh Blvd.
St. Louis, MO 63141-7816
Telephone: 314-993-1700
Web site: <http://www.braces.org>

American Association of Public Health Dentistry

P.O. Box 7536
Springfield, IL 62791-7536
Telephone: 217-391-0218
Web site: <http://www.aaphd.org>

American College of Prosthodontists

211 E. Chicago Ave., Suite 1000
Chicago, IL 60611
Telephone: 312-573-1260
Web site: <http://www.prosthodontics.org>

American Dental

Assistants Association

35 E. Wacker Drive, Suite 1730
Chicago, IL 60601-2211
Telephone: 312-541-1550
Web site: <http://www.dentalassistant.org>

American Dental Association

211 E. Chicago Ave.
Chicago, IL 60611-2678
Telephone: 312-440-2500
Web site: <http://www.ada.org>

**American Dental
Education Association**

1400 K St. NW, Suite 1100
Washington, DC 20005
Telephone: 202-289-7201
Web site: <http://www.adea.org>

**American Dental
Hygienists' Association**

444 N. Michigan Ave., Suite 3400
Chicago, IL 60611
Telephone: 312-440-8900
Web site: <http://www.adha.org>

Academy of Comprehensive Esthetics

Web site: <http://www.ACEsthetics.com>

Dentalsite

Web site: <http://www.dentalsite.com>

HealthWeb

Web site: <http://www.healthweb.org>

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