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Understanding Common Fee Structures in Orthodontics Insurance Coverage That Reduces Out of Pocket Costs Exploring Payment Plans and Financing Arrangements Differences Between Flexible Spending and Health Savings Factors Influencing Variations in Treatment Pricing Asking the Right Questions During Cost Consultations Allocation of Funds for Long Term Orthodontic Care Prioritizing Necessary Treatments Within a Budget Navigating Claims and Reimbursements Step by Step How Location Affects Orthodontic Expenses Educating Patients on Financial Planning for Treatment Strategies to Keep Future Costs Predictable
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Navigating the world of orthodontic treatment for children can feel overwhelming, especially when it comes to understanding the financial aspects. Cost consultations are a critical step in the process, and knowing what to ask can make a significant difference in your decision-making and financial planning.

When you first sit down with an orthodontist, it's natural to feel a bit nervous or uncertain. The key is to approach the conversation with preparation and confidence. Start by asking about the total estimated cost of treatment. Orthodontic care can improve both dental health and self-confidence **Pediatric orthodontic care** medicine. Don't just accept a single number - request a detailed breakdown that includes initial assessments, potential additional procedures, and the full course of treatment.

Insurance coverage is another crucial area to explore. Many parents don't realize the extent of their dental insurance benefits, so ask specific questions about what's covered, what your out-of-pocket expenses might be, and if there are any limitations or waiting periods. Some orthodontic practices offer payment plans or financing options, so inquire about these possibilities as well.

It's also important to understand the different treatment options available. Traditional braces might have one price point, while newer technologies like clear aligners could have a different cost structure. Ask about the pros and cons of each approach, not just from a financial perspective, but also in terms of effectiveness and comfort for your child.

Don't be afraid to ask about potential additional costs. Some treatments might require extra appointments, specialized equipment, or follow-up procedures. A transparent discussion upfront can help you avoid unexpected financial surprises down the road.

Remember, a good orthodontist will welcome your questions and appreciate your desire to fully understand the treatment process. They should be willing to provide clear, detailed information and help you make an informed decision that works for both your child's dental health and your family's budget.

By approaching the cost consultation with curiosity, thoroughness, and a bit of preparation, you'll be well-equipped to make the best choice for your child's orthodontic treatment. The right questions can provide clarity, reduce stress, and help you feel confident in your

decision.

Understanding the Initial Consultation Process and Its Importance for Asking the Right Questions During Cost Consultations

The initial consultation is a critical moment in any professional interaction, especially when discussing financial matters like project costs and budgeting. This first meeting sets the tone for the entire relationship and can significantly impact the success of future collaboration.

When entering a cost consultation, preparation is key. The initial consultation serves as a foundational moment where both parties can establish clear communication, mutual understanding, and realistic expectations. It's not just about gathering information, but about building trust and creating a framework for transparent dialogue.

The most effective consultations begin with active listening. Professionals should approach these meetings with genuine curiosity, asking open-ended questions that encourage detailed responses. Instead of simply collecting data, the goal is to understand the broader context of the project, client needs, and potential challenges.

Key questions might include exploring the client's overall objectives, budget constraints, timeline expectations, and any specific concerns they might have. By demonstrating empathy and genuine interest, consultants can create an environment where clients feel comfortable sharing crucial details that might otherwise remain unspoken.

Moreover, the initial consultation provides an opportunity to assess potential compatibility. Both parties can evaluate whether their working styles, expectations, and communication approaches align. This early assessment can prevent misunderstandings and potential conflicts down the line.

Technical expertise matters, but emotional intelligence is equally important during these interactions. Skilled professionals recognize that cost consultations are not just about numbers, but about understanding human motivations, fears, and aspirations related to financial investments.

Documenting the discussion thoroughly is another crucial aspect of the initial consultation. Clear, comprehensive notes ensure that both parties have a shared understanding of the conversation and can refer back to key points as the project progresses.

In conclusion, the initial consultation is far more than a preliminary meeting. It's a strategic opportunity to establish trust, gather comprehensive information, and lay the groundwork for a successful professional relationship. By approaching these consultations with preparation, empathy, and strategic questioning, professionals can significantly enhance the likelihood of project success.

Insurance Coverage and Impact on Orthodontic Expenses

When navigating the complex world of medical treatment costs, asking the right financial questions can make a significant difference in managing your healthcare expenses. During cost consultations, it's crucial to approach the conversation with clarity and thoroughness to avoid unexpected financial burdens.

First and foremost, you'll want to understand the total estimated cost of your treatment. This means going beyond just the surface-level price and digging into the details. Ask about all potential expenses, including initial consultations, procedure costs, follow-up care, and any potential additional treatments or complications that might arise.

Insurance coverage is another critical area to explore. Request a comprehensive breakdown of what your insurance will cover and what you'll be responsible for out of pocket. Don't be afraid to ask about in-network versus out-of-network costs, as these can dramatically impact your final expenses. Inquire about your deductible, co-pays, and any potential coverage limitations.

Payment options are equally important. Many healthcare providers offer payment plans or financial assistance programs that can help make treatment more affordable. Ask about sliding scale options, potential discounts for upfront payments, or installment plans that can spread out your financial responsibility.

Consider asking about alternative treatment options that might be more cost-effective. Sometimes, there are multiple approaches to addressing a medical issue, and some may be more budget-friendly than others. A transparent conversation can help you understand all available options.

Don't forget to discuss potential hidden costs. These might include medication expenses, medical supplies, rehabilitation, or follow-up treatments that aren't immediately apparent. A comprehensive understanding of the full financial picture can help you plan more effectively.

Lastly, always request a detailed written estimate. Verbal quotes can change, but a written document provides you with a concrete reference point and potential protection against unexpected charges.

Remember, being proactive and asking these key financial questions isn't about being difficult – it's about being an informed and responsible patient who wants to understand their healthcare investment completely.

Payment Plan Options for Pediatric Orthodontic Care

Navigating the world of pediatric orthodontic care can feel like wandering through a complex maze of insurance options and financial considerations. When parents first sit down for a cost consultation, they often feel overwhelmed by the potential expenses associated with braces or other orthodontic treatments.

Understanding insurance coverage is crucial from the start. Many dental insurance plans offer partial coverage for orthodontic care, but the details can vary widely. Some plans cover a percentage of treatment costs, while others provide a lifetime maximum benefit for orthodontic work. Parents should carefully review their specific insurance policy and ask detailed questions about what's actually included.

During consultations, it's essential to ask probing questions about potential reimbursement options. What percentage of treatment will the insurance cover? Are there age restrictions? Do pre-authorization requirements exist? These seemingly simple questions can save families thousands of dollars in unexpected expenses.

Some practices offer flexible payment plans that can help manage out-of-pocket costs. Many orthodontists understand that not every family can afford upfront payments and are willing to work out manageable monthly installments. Additionally, some clinics partner with healthcare financing companies to provide more affordable options.

Flexible Spending Accounts (FSAs) and Health Savings Accounts (HSAs) can also be valuable tools for managing orthodontic expenses. These accounts allow families to set aside pre-tax dollars specifically for medical and dental treatments, potentially reducing the overall financial burden.

Parents should also investigate whether their employer offers any supplemental dental benefits or if they qualify for any special assistance programs. Some organizations provide additional support for pediatric dental care that families might not initially know about.

Ultimately, being prepared, asking thorough questions, and exploring multiple financial avenues can make the journey of pediatric orthodontic care much less stressful. Knowledge truly is power when it comes to managing healthcare costs for children.

Factors Influencing Orthodontic Treatment Costs

When navigating the complex world of medical or professional services, understanding payment options can be just as crucial as the service itself. Cost consultations are more than just discussions about money—they're opportunities to find realistic, manageable financial solutions that align with your personal circumstances.

During these conversations, it's essential to approach the dialogue with openness and curiosity. Don't be afraid to ask about various payment plans that might break down a large expense into more digestible monthly installments. Many providers understand that not everyone can afford a lump sum payment and are willing to work with clients to create flexible arrangements.

Flexible financing alternatives have become increasingly common, especially in healthcare, education, and professional services. Some options might include sliding scale fees based on income, extended payment terms, or even interest-free plans for a specific period. The key is to be proactive and transparent about your financial situation.

When discussing payment options, come prepared with questions like: "Do you offer monthly payment plans?" or "Are there different financing options available?" Some providers might partner with third-party financing companies that specialize in creating customized payment solutions.

Remember, the goal isn't just to reduce immediate financial strain but to find a sustainable approach that doesn't cause undue stress. A good provider will be patient, understanding, and willing to explore multiple strategies to help you manage costs effectively.

By being informed, asking the right questions, and showing a genuine commitment to finding a workable solution, you can transform a potentially intimidating financial discussion into a collaborative problem-solving session.

Comparing Different Orthodontic Practices and Their Pricing Strategies

When diving into the world of medical treatments, patients often find themselves navigating a complex landscape of options, each with its own set of financial considerations. Comparing different treatment options and their respective cost implications isn't just about finding the cheapest solution—it's about understanding the true value of care.

During cost consultations, asking the right questions becomes crucial. Patients should approach these discussions with curiosity and thoroughness, looking beyond the surface-level price tag. It's not just about how much something costs, but what you're actually getting for that investment in your health.

Consider, for example, a treatment with a higher upfront cost but potentially fewer long-term complications versus a cheaper initial option that might require additional interventions down the line. This is where smart questioning comes into play. You might want to ask about total treatment lifecycle costs, potential follow-up expenses, and insurance coverage.

Some key questions to explore include: What are the alternative treatment options? How do their long-term outcomes compare? Are there generic alternatives that provide similar effectiveness at a lower cost? What percentage of the treatment will be covered by insurance?

It's also important to discuss potential hidden costs. These might include transportation expenses, potential time off work, rehabilitation costs, or additional medications. A comprehensive approach means looking at the entire financial picture, not just the immediate medical expense.

Healthcare professionals appreciate patients who are engaged and inquisitive. By demonstrating a genuine interest in understanding the financial aspects of treatment, you're not just protecting your wallet-you're becoming an active participant in your own healthcare journey.

Ultimately, the goal is to find a treatment option that offers the best balance between medical effectiveness and financial feasibility. It's about making an informed decision that considers both your health needs and your financial reality.

Additional Fees and Potential Hidden Expenses in Orthodontic Treatment

When diving into dental cost consultations, it's crucial to look beyond the immediate price tag and consider the long-term financial implications of your dental treatment plan. Think of your oral health as an investment, not just an expense.

Many patients make the mistake of choosing the cheapest option upfront, only to discover they'll need more extensive and expensive treatments down the line. For instance, a slightly more expensive dental procedure that provides a more durable solution might save you

thousands in future corrective work.

Consider potential future interventions like potential crown replacements, potential implant maintenance, or additional corrective procedures. Each dental decision you make today can significantly impact your oral health and financial outlook years from now. A comprehensive treatment plan that addresses potential future needs can actually be more cost-effective in the long run.

Preventative care is another critical aspect of long-term cost management. Regular check-ups, proper maintenance, and early intervention can prevent more expensive treatments later. It's like maintaining a car - small, consistent investments in maintenance can prevent major, costly repairs.

Don't be afraid to ask your dentist about:

- Longevity of proposed treatments
- Potential future complications
- Alternative treatment options
- Long-term maintenance requirements

By taking a holistic view of dental costs and potential future interventions, you're not just protecting your teeth, but also your financial well-being. Smart, forward-thinking decisions now can lead to healthier teeth and a more manageable dental budget in the years ahead.

When diving into the world of medical or dental consultations, understanding the full financial landscape can feel like navigating a complex maze. Clarifying hidden or additional expenses beyond standard treatment fees is crucial for patients to make informed decisions about their healthcare.

During cost consultations, patients often focus solely on the primary treatment price, inadvertently overlooking potential supplementary charges. These unexpected expenses can quickly transform an seemingly affordable procedure into a financial burden. It's essential to

ask probing questions that unveil the complete cost picture.

Some key areas to explore include potential additional fees for specialized equipment, laboratory work, follow-up appointments, or post-treatment care. For instance, a dental implant might have a base price, but the total cost could include preparatory procedures, imaging, anesthesia, and recovery materials. Similarly, surgical treatments might involve pre-operative tests, specialized medications, or recovery support that aren't immediately apparent.

Patients should approach these consultations with a detective-like mindset, asking direct questions like, "Are there any potential additional costs not included in this initial quote?" or "What unexpected expenses might arise during or after my treatment?" Healthcare providers appreciate transparent communication and should be willing to provide comprehensive financial breakdowns.

Insurance coverage adds another layer of complexity. Understanding what your specific plan covers and what might be out-of-pocket can prevent surprising bills later. Don't hesitate to request detailed documentation explaining potential extra expenses.

By being proactive and thorough during initial consultations, patients can develop a more accurate understanding of their potential financial commitment, reducing stress and preventing unexpected financial strain. Knowledge truly is power in managing healthcare costs.

Evaluating the Cost-Effectiveness of Different Orthodontic Approaches for Children

When parents sit down with an orthodontist to discuss potential treatment options for their child, the conversation often revolves around more than just straightening teeth. It's about understanding the long-term value and financial implications of different orthodontic approaches.

Cost-effectiveness in pediatric orthodontics isn't just about finding the cheapest solution. It's about balancing quality of care, treatment duration, and potential long-term benefits. Traditional metal braces might seem less expensive upfront, but newer technologies like clear aligners could potentially reduce overall treatment time and follow-up appointments.

Several key factors come into play when evaluating these options. First, the complexity of the child's dental misalignment matters significantly. Some approaches work better for specific types of orthodontic issues. A comprehensive assessment helps determine which method provides the most efficient and effective treatment.

Insurance coverage and flexible payment plans also play crucial roles in the decision-making process. Parents should ask detailed questions about total treatment costs, potential additional expenses, and the likelihood of future interventions.

Moreover, considering the psychological impact on the child is essential. A treatment that boosts confidence and feels less invasive might be worth a slightly higher investment. Clear aligners, for instance, can be less socially challenging for children compared to traditional braces.

Ultimately, the most cost-effective approach depends on individual circumstances. Consulting with experienced orthodontists, comparing multiple treatment plans, and understanding the comprehensive long-term benefits will help parents make informed decisions that balance medical necessity with financial practicality.

The goal is finding a solution that provides optimal dental health, minimizes future complications, and fits within the family's budget - a delicate but achievable balance in pediatric orthodontic care.

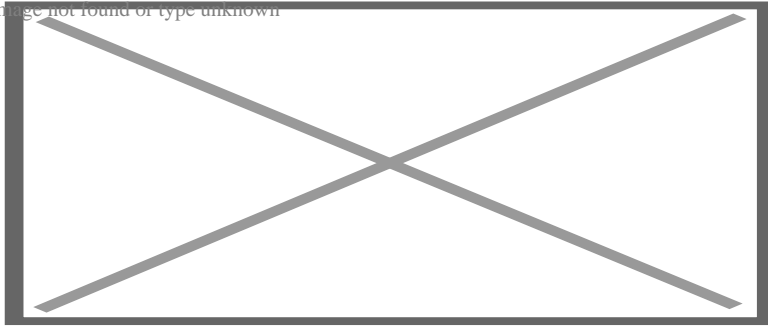
About dental braces



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Dental braces

Dental braces (also known as **orthodontic braces**, or simply **braces**) are devices used in orthodontics that align and straighten teeth and help position them with regard to a person's bite, while also aiming to improve dental health. They are often used to correct underbites, as well as malocclusions, overbites, open bites, gaps, deep bites, cross bites, crooked teeth, and various other flaws of the teeth and jaw. Braces can be either cosmetic or structural. Dental braces are often used in conjunction with other orthodontic appliances to help widen the palate or jaws and to otherwise assist in shaping the teeth and jaws.

Process

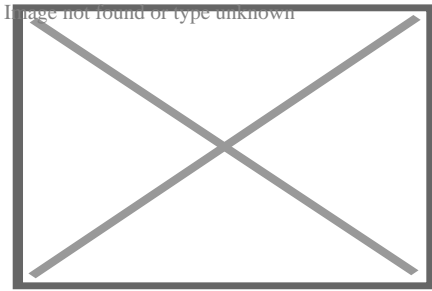
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The application of braces moves the teeth as a result of force and pressure on the teeth. Traditionally, four basic elements are used: brackets, bonding material, arch wire, and ligature elastic (also called an "O-ring"). The teeth move when the arch wire puts pressure on the brackets and teeth. Sometimes springs or rubber bands are used to put more force in a specific direction.^[1]

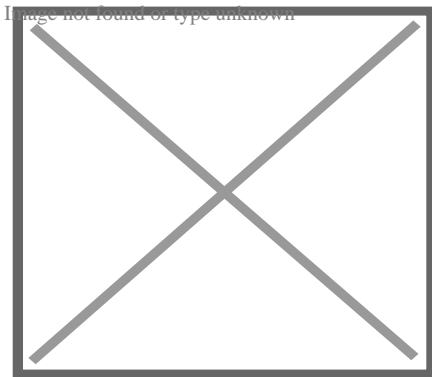
Braces apply constant pressure which, over time, moves teeth into the desired positions. The process loosens the tooth after which new bone grows to support the tooth in its new position. This is called bone remodelling. Bone remodelling is a biomechanical process responsible for making bones stronger in response to sustained load-bearing activity and weaker in the absence of carrying a load. Bones are made of cells called osteoclasts and osteoblasts. Two different kinds of bone resorption are possible: direct resorption, which starts from the lining cells of the alveolar bone, and indirect or retrograde resorption, which occurs when the periodontal ligament has been subjected to an excessive amount and duration of compressive stress.^[2] Another important factor associated with tooth movement is bone deposition. Bone deposition occurs in the distracted periodontal ligament. Without bone deposition, the tooth will loosen, and voids will occur distal to the direction of tooth movement.^[3]

Types

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"Clear" braces



Upper and Lower Jaw Functional Expanders

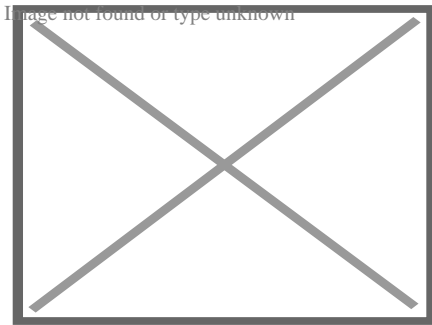
- **Traditional metal wired braces** (also known as "train track braces") are stainless-steel and are sometimes used in combination with titanium. Traditional metal braces are the most common type of braces.^[4] These braces have a metal bracket with elastic ties (also known as rubber bands) holding the wire onto the metal brackets. The second-most common type of braces is self-ligating braces, which have a built-in system to secure the archwire to the brackets and do not require elastic ties. Instead, the wire goes through the bracket. Often with this type of braces, treatment time is reduced, there is less pain on the teeth, and fewer adjustments are required than with traditional braces.
- **Gold-plated stainless steel** braces are often employed for patients allergic to nickel (a basic and important component of stainless steel), but may also be chosen for aesthetic reasons.
- **Lingual braces** are a cosmetic alternative in which custom-made braces are bonded to the back of the teeth making them externally invisible.
- **Titanium braces** resemble stainless-steel braces but are lighter and just as strong. People with allergies to nickel in steel often choose titanium braces, but they are more expensive than stainless steel braces.
- **Customized orthodontic treatment systems** combine high technology including 3-D imaging, treatment planning software and a robot to custom bend the wire. Customized systems such as this offer faster treatment times and more efficient

results.[⁵]

- **Progressive, clear removable aligners** may be used to gradually move teeth into their final positions. Aligners are generally not used for complex orthodontic cases, such as when extractions, jaw surgery, or palate expansion are necessary.^[medical citation needed]
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Fitting procedure

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A patient's teeth are prepared for the application of braces.

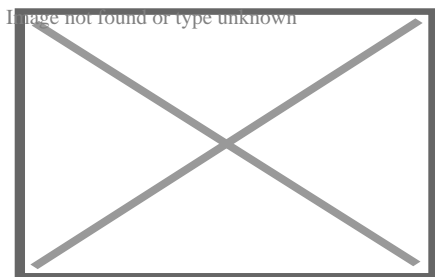
Orthodontic services may be provided by any licensed dentist trained in orthodontics. In North America, most orthodontic treatment is done by orthodontists, who are dentists in the diagnosis and treatment of *malocclusions*—malalignments of the teeth, jaws, or both. A dentist must complete 2–3 years of additional post-doctoral training to earn a specialty certificate in orthodontics. There are many general practitioners who also provide orthodontic services.

The first step is to determine whether braces are suitable for the patient. The doctor consults with the patient and inspects the teeth visually. If braces are appropriate, a records appointment is set up where X-rays, moulds, and impressions are made. These records are analyzed to determine the problems and the proper course of action. The use of digital models is rapidly increasing in the orthodontic industry. Digital treatment starts with the creation of a three-dimensional digital model of the patient's arches. This model is produced by laser-scanning plaster models created using dental impressions. Computer-automated treatment simulation has the ability to automatically separate the gums and teeth from one another and can handle malocclusions well; this software enables clinicians to ensure, in a virtual setting, that the selected treatment will produce the optimal outcome, with minimal user input.^[medical citation needed]

Typical treatment times vary from six months to two and a half years depending on the complexity and types of problems. Orthognathic surgery may be required in extreme cases. About 2 weeks before the braces are applied, orthodontic spacers may be required to spread apart back teeth in order to create enough space for the bands.

Teeth to be braced will have an adhesive applied to help the cement bond to the surface of the tooth. In most cases, the teeth will be banded and then brackets will be added. A bracket will be applied with dental cement, and then cured with light until hardened. This process usually takes a few seconds per tooth. If required, orthodontic spacers may be inserted between the molars to make room for molar bands to be placed at a later date. Molar bands are required to ensure brackets will stick. Bands are also utilized when dental fillings or other dental works make securing a bracket to a tooth infeasible. Orthodontic tubes (stainless steel tubes that allow wires to pass through them), also known as molar tubes, are directly bonded to molar teeth either by a chemical curing or a light curing adhesive. Usually, molar tubes are directly welded to bands, which is a metal ring that fits onto the molar tooth. Directly bonded molar tubes are associated with a higher failure rate when compared to molar bands cemented with glass ionomer cement. Failure of orthodontic brackets, bonded tubes or bands will increase the overall treatment time for the patient. There is evidence suggesting that there is less enamel decalcification associated with molar bands cemented with glass ionomer cement compared with orthodontic tubes directly cemented to molars using a light cured adhesive. Further evidence is needed to withdraw a more robust conclusion due to limited data.[7]

An archwire will be threaded between the brackets and affixed with elastic or metal ligatures. Ligatures are available in a wide variety of colours, and the patient can choose which colour they like. Arch wires are bent, shaped, and tightened frequently to achieve the desired results.



Dental braces, with a transparent power chain, removed after completion of treatment.

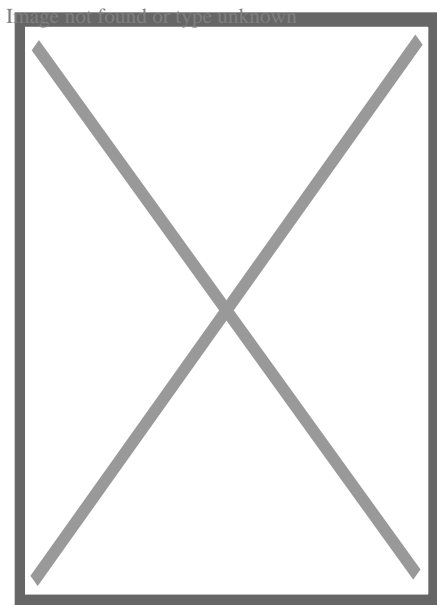
Modern orthodontics makes frequent use of nickel-titanium archwires and temperature-sensitive materials. When cold, the archwire is limp and flexible, easily threaded between brackets of any configuration. Once heated to body temperature, the arch wire will stiffen and seek to retain its shape, creating constant light force on the teeth.

Brackets with hooks can be placed, or hooks can be created and affixed to the arch wire to affix rubber bands. The placement and configuration of the rubber bands will depend on the course of treatment and the individual patient. Rubber bands are made in different diameters, colours, sizes, and strengths. They are also typically available in two versions: Coloured or clear/opaque.

The fitting process can vary between different types of braces, though there are similarities such as the initial steps of moulding the teeth before application. For example, with clear braces, impressions of a patient's teeth are evaluated to create a series of trays, which fit to the patient's mouth almost like a protective mouthpiece. With some forms of braces, the brackets are placed in a special form that is customized to the patient's mouth, drastically reducing the application time.

In many cases, there is insufficient space in the mouth for all the teeth to fit properly. There are two main procedures to make room in these cases. One is extraction: teeth are removed to create more space. The second is expansion, in which the palate or arch is made larger by using a palatal expander. Expanders can be used with both children and adults. Since the bones of adults are already fused, expanding the palate is not possible without surgery to separate them. An expander can be used on an adult without surgery but would be used to expand the dental arch, and not the palate.

Sometimes children and teenage patients, and occasionally adults, are required to wear a headgear appliance as part of the primary treatment phase to keep certain teeth from moving (for more detail on headgear and facemask appliances see Orthodontic headgear). When braces put pressure on one's teeth, the periodontal membrane stretches on one side and is compressed on the other. This movement needs to be done slowly or otherwise, the patient risks losing their teeth. This is why braces are worn as long as they are and adjustments are only made every so often.



Young Colombian man during an adjustment visit for his orthodontics

Braces are typically adjusted every three to six weeks. This helps shift the teeth into the correct position. When they get adjusted, the orthodontist removes the coloured or metal ligatures keeping the arch wire in place. The arch wire is then removed and may be replaced or modified. When the archwire has been placed back into the mouth, the

patient may choose a colour for the new elastic ligatures, which are then affixed to the metal brackets. The adjusting process may cause some discomfort to the patient, which is normal.

Post-treatment

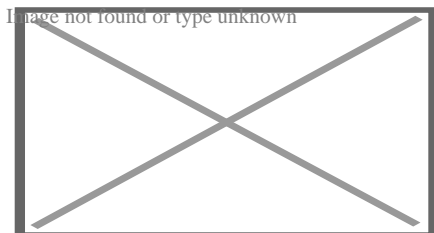
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Patients may need post-orthodontic surgery, such as a fibrotomy or alternatively a gum lift, to prepare their teeth for retainer use and improve the gumline contours after the braces come off. After braces treatment, patients can use a transparent plate to keep the teeth in alignment for a certain period of time. After treatment, patients usually use transparent plates for 6 months. In patients with long and difficult treatment, a fixative wire is attached to the back of the teeth to prevent the teeth from returning to their original state.^[8]

Retainers

[edit]

Main article: Retainer (orthodontic device)



Hawley retainers are the most common type of retainers. This picture shows retainers for the top (right) and bottom (left) of the mouth.

In order to prevent the teeth from moving back to their original position, retainers are worn once the treatment is complete. Retainers help in maintaining and stabilizing the position of teeth long enough to permit the reorganization of the supporting structures after the active phase of orthodontic therapy. If the patient does not wear the retainer appropriately and/or for the right amount of time, the teeth may move towards their previous position. For regular braces, Hawley retainers are used. They are made of metal hooks that surround the teeth and are enclosed by an acrylic plate shaped to fit the patient's palate. For Clear Removable braces, an Essix retainer is used. This is similar to the original aligner; it is a clear plastic tray that is firmly fitted to the teeth and stays in place without a plate fitted to the palate. There is also a bonded retainer where a wire is permanently bonded to the lingual side of the teeth, usually the lower teeth

only.

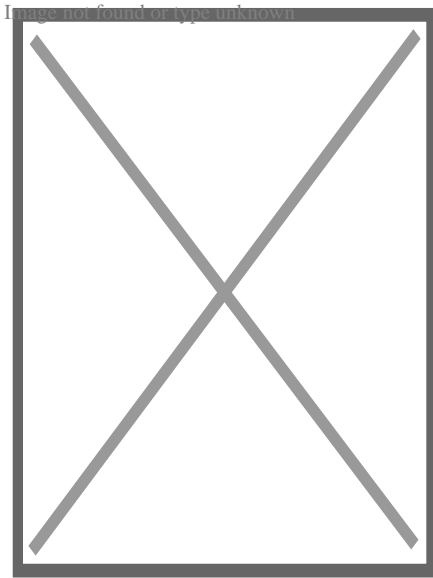
Headgear

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Main article: Orthodontic headgear

Headgear needs to be worn between 12 and 22 hours each day to be effective in correcting the overbite, typically for 12 to 18 months depending on the severity of the overbite, how much it is worn and what growth stage the patient is in. Typically the prescribed daily wear time will be between 14 and 16 hours a day and is frequently used as a post-primary treatment phase to maintain the position of the jaw and arch. Headgear can be used during the night while the patient sleeps.^[9]*[better source needed]*

Orthodontic headgear usually consists of three major components:



Full orthodontic headgear with head cap, fitting straps, facebow and elastics

1. Facebow: the facebow (or J-Hooks) is fitted with a metal arch onto headgear tubes attached to the rear upper and lower molars. This facebow then extends out of the mouth and around the patient's face. J-Hooks are different in that they hook into the patient's mouth and attach directly to the brace (see photo for an example of J-Hooks).
2. Head cap: the head cap typically consists of one or a number of straps fitting around the patient's head. This is attached with elastic bands or springs to the facebow. Additional straps and attachments are used to ensure comfort and safety (see photo).

3. Attachment: typically consisting of rubber bands, elastics, or springs—joins the facebow or J-Hooks and the head cap together, providing the force to move the upper teeth, jaw backwards.

The headgear application is one of the most useful appliances available to the orthodontist when looking to correct a Class II malocclusion. See more details in the section Orthodontic headgear.

Pre-finisher

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The pre-finisher is moulded to the patient's teeth by use of extreme pressure on the appliance by the person's jaw. The product is then worn a certain amount of time with the user applying force to the appliance in their mouth for 10 to 15 seconds at a time. The goal of the process is to increase the exercise time in applying the force to the appliance. If a person's teeth are not ready for a proper retainer the orthodontist may prescribe the use of a preformed finishing appliance such as the pre-finisher. This appliance fixes gaps between the teeth, small spaces between the upper and lower jaw, and other minor problems.

Complications and risks

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A group of dental researchers, Fatma Boke, Cagri Gazioglu, Selvi Akkaya, and Murat Akkaya, conducted a study titled "Relationship between orthodontic treatment and gingival health." The results indicated that some orthodontist treatments result in gingivitis, also known as gum disease. The researchers concluded that functional appliances used to harness natural forces (such as improving the alignment of bites) do not usually have major effects on the gum after treatment.^[10] However, fixed appliances such as braces, which most people get, can result in visible plaque, visible inflammation, and gum recession in a majority of the patients. The formation of plaques around the teeth of patients with braces is almost inevitable regardless of plaque control and can result in mild gingivitis. But if someone with braces does not clean their teeth carefully, plaques will form, leading to more severe gingivitis and gum recession.

Experiencing some pain following fitting and activation of fixed orthodontic braces is very common and several methods have been suggested to tackle this.^[11]^[12] Pain associated with orthodontic treatment increases in proportion to the amount of force that is applied to the teeth. When a force is applied to a tooth via a brace, there is a

reduction in the blood supply to the fibres that attach the tooth to the surrounding bone. This reduction in blood supply results in inflammation and the release of several chemical factors, which stimulate the pain response. Orthodontic pain can be managed using pharmacological interventions, which involve the use of analgesics applied locally or systemically. These analgesics are divided into four main categories, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol and local anesthesia. The first three of these analgesics are commonly taken systemically to reduce orthodontic pain.^[13]

A Cochrane Review in 2017 evaluated the pharmacological interventions for pain relief during orthodontic treatment. The study concluded that there was moderate-quality evidence that analgesics reduce the pain associated with orthodontic treatment. However, due to a lack of evidence, it was unclear whether systemic NSAIDs were more effective than paracetamol, and whether topical NSAIDs were more effective than local anaesthesia in the reduction of pain associated with orthodontic treatment. More high-quality research is required to investigate these particular comparisons.^[13]

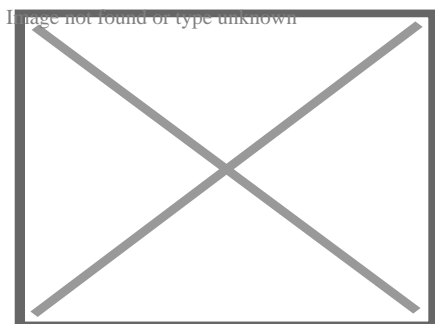
The dental displacement obtained with the orthodontic appliance determines in most cases some degree of root resorption. Only in a few cases is this side effect large enough to be considered real clinical damage to the tooth. In rare cases, the teeth may fall out or have to be extracted due to root resorption.^{[14][15]}

History

[edit]

Ancient

[edit]



Old Braces at a museum in Jbeil, Lebanon

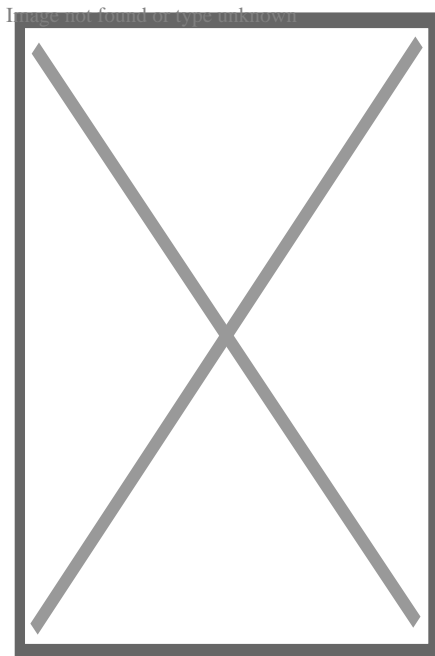
According to scholars and historians, braces date back to ancient times. Around 400–300 BC, Hippocrates and Aristotle contemplated ways to straighten teeth and fix

various dental conditions. Archaeologists have discovered numerous mummified ancient individuals with what appear to be metal bands wrapped around their teeth. Catgut, a type of cord made from the natural fibres of an animal's intestines, performed a similar role to today's orthodontic wire in closing gaps in the teeth and mouth.^[16]

The Etruscans buried their dead with dental appliances in place to maintain space and prevent the collapse of the teeth during the afterlife. A Roman tomb was found with a number of teeth bound with gold wire documented as a ligature wire, a small elastic wire that is used to affix the arch wire to the bracket. Even Cleopatra wore a pair. Roman philosopher and physician Aulus Cornelius Celsus first recorded the treatment of teeth by finger pressure. Unfortunately, due to a lack of evidence, poor preservation of bodies, and primitive technology, little research was carried out on dental braces until around the 17th century, although dentistry was making great advancements as a profession by then.^[citation needed]

18th century

[edit]



Portrait of Fauchard from his 1728 edition of *"The Surgical Dentist"*.

Orthodontics truly began developing in the 18th and 19th centuries. In 1669, French dentist Pierre Fauchard, who is often credited with inventing modern orthodontics, published a book entitled *"The Surgeon Dentist"* on methods of straightening teeth. Fauchard, in his practice, used a device called a "Bandeau", a horseshoe-shaped piece

of iron that helped expand the palate. In 1754, another French dentist, Louis Bourdet, dentist to the King of France, followed Fauchard's book with *The Dentist's Art*, which also dedicated a chapter to tooth alignment and application. He perfected the "Bandeau" and was the first dentist on record to recommend extraction of the premolar teeth to alleviate crowding and improve jaw growth.

19th century

[edit]

Although teeth and palate straightening and/or pulling were used to improve the alignment of remaining teeth and had been practised since early times, orthodontics, as a science of its own, did not really exist until the mid-19th century. Several important dentists helped to advance dental braces with specific instruments and tools that allowed braces to be improved.

In 1819, Christophe François Delabarre introduced the wire crib, which marked the birth of contemporary orthodontics, and gum elastics were first employed by Maynard in 1843. Tucker was the first to cut rubber bands from rubber tubing in 1850. Dentist, writer, artist, and sculptor Norman William Kingsley in 1858 wrote the first article on orthodontics and in 1880, his book, *Treatise on Oral Deformities*, was published. A dentist named John Nutting Farrar is credited for writing two volumes entitled, *A Treatise on the Irregularities of the Teeth and Their Corrections* and was the first to suggest the use of mild force at timed intervals to move teeth.

20th century

[edit]


In the early 20th century, Edward Angle devised the first simple classification system for malocclusions, such as Class I, Class II, and so on. His classification system is still used today as a way for dentists to describe how crooked teeth are, what way teeth are pointing, and how teeth fit together. Angle contributed greatly to the design of orthodontic and dental appliances, making many simplifications. He founded the first school and college of orthodontics, organized the American Society of Orthodontia in 1901 which became the American Association of Orthodontists (AAO) in the 1930s, and founded the first orthodontic journal in 1907. Other innovations in orthodontics in the late 19th and early 20th centuries included the first textbook on orthodontics for

children, published by J.J. Guilford in 1889, and the use of rubber elastics, pioneered by Calvin S. Case, along with Henry Albert Baker.

Today, space age wires (also known as dental arch wires) are used to tighten braces. In 1959, the Naval Ordnance Laboratory created an alloy of nickel and titanium called Nitinol. NASA further studied the material's physical properties.^[17] In 1979, Dr. George Andreasen developed a new method of fixing braces with the use of the Nitinol wires based on their superelasticity. Andreasen used the wire on some patients and later found out that he could use it for the entire treatment. Andreasen then began using the nitinol wires for all his treatments and as a result, dental doctor visits were reduced, the cost of dental treatment was reduced, and patients reported less discomfort.

See also

[edit]

-  [Medicine portal](#) limited to topics not known
- Mandibular advancement splint
- Oral and maxillofacial surgery
- Orthognathic surgery
- Prosthodontics
- Trismus
- Dental implant

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[edit]

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External links

[edit]

- Useful Resources: FAQ and Downloadable eBooks at Orthodontics Australia
- Orthos Explain: Treatment Options at Orthodontics Australia

- o  Media related to Dental braces at Wikimedia Commons

- o v
- o t
- o e

Orthodontics

Diagnosis

- o Bolton analysis
- o Cephalometric analysis
- o Cephalometry
- o Dentition analysis
- o Failure of eruption of teeth
- o Little's Irregularity Index
- o Malocclusion
- o Scissor bite
- o Standard anatomical position
- o Tooth ankylosis
- o Tongue thrust
- o Overbite
- o Overjet
- o Open bite
- o Crossbite

Conditions

- o Dental crowding
- o Dental spacing
- o Bimaxillary Protrusion
- o Prognathism
- o Retrognathism
- o Maxillary hypoplasia
- o Condylar hyperplasia
- o Overeruption
- o Mouth breathing
- o Temporomandibular dysfunction

- ACCO appliance
- Archwire
- Activator appliance
- Braces
- Damon system
- Elastics
- Frankel appliance
- Invisalign
- Lingual arch
- Lip bumper
- Herbst Appliance
- List of orthodontic functional appliances
- List of palatal expanders
- Lingual braces
- Headgear
- Orthodontic technology
- Orthodontic spacer
- Palatal lift prosthesis
- Palatal expander
- Quad helix
- Retainer
- SureSmile
- Self-ligating braces
- Splint activator
- Twin Block Appliance
- Anchorage (orthodontics)
- Cantilever mechanics
- Fiberotomy
- Interproximal reduction
- Intrusion (orthodontics)
- Molar distalization
- SARPE
- Serial extraction
- Beta-titanium
- Nickel titanium
- Stainless steel
- TiMolium
- Elgiloy
- Ceramic
- Composite
- Dental elastics

Appliances

Procedures

Materials

**Notable
contributors**

- Edward Angle
- Spencer Atkinson
- Clifford Ballard
- Raymond Begg
- Hans Peter Bimler
- Samir Bishara
- Arne Björk
- Charles B. Bolton
- Holly Broadbent Sr.
- Allan G. Brodie
- Charles J. Burstone
- Peter Buschang
- Calvin Case
- Harold Chapman (Orthodontist)
- David Di Biase
- Jean Delaire
- Terry Dischinger
- William B. Downs
- John Nutting Farrar
- Rolf Frankel
- Sheldon Friel
- Thomas M. Graber
- Charles A. Hawley
- Reed Holdaway
- John Hooper (Orthodontist)
- Joseph Jarabak
- Harold Kesling
- Albert Ketcham
- Juri Kurol
- Craven Kurz
- Benno Lischer
- James A. McNamara
- Birte Melsen
- Robert Moyers
- Hayes Nance
- Ravindra Nanda
- George Northcroft
- Dean Harold Noyes
- Frederick Bogue Noyes
- Albin Oppenheim
- Herbert A. Pullen
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- Alfred Paul Rogers
- Ronald Roth
- Everett Shapiro
- L. F. Andrews
- Frederick Lester Stanton

- American Association of Orthodontists
- American Board of Orthodontics
- British Orthodontic Society
- Organizations**
 - Canadian Association of Orthodontists
 - Indian Orthodontic Society
 - Italian Academy of Orthodontic Technology
 - Society for Orthodontic Dental Technology (Germany)
- American Journal of Orthodontics and Dentofacial Orthopedics
- Journals**
 - The Angle Orthodontist
 - Journal of Orthodontics
- Institution**
 - Angle School of Orthodontia

- Germany
- United States

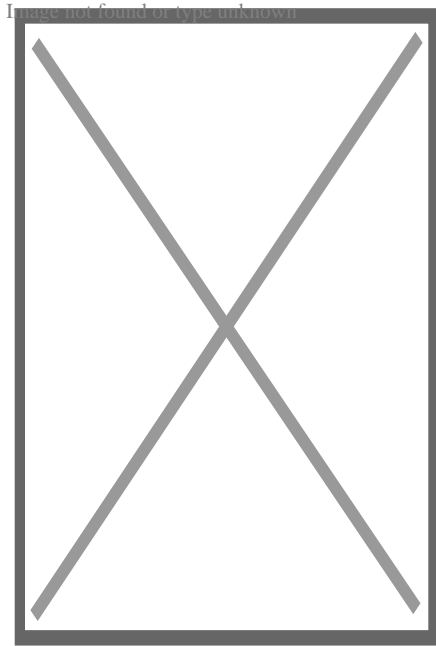
Authority control databases: National Image not found in scope unknown **Edit this at Wikidata**

- BnF data
- Israel

About dentistry

- Sub-Millimeter Surgical Dexterity
- Knowledge of human health, disease, pathology, and anatomy
- Communication/Interpersonal Skills
- Analytical Skills
- Critical Thinking
- Empathy/Professionalism
- Private practices
- Primary care clinics
- Hospitals
- Physician
- dental assistant
- dental technician
- dental hygienist
- various dental specialists

Dentistry



A dentist treats a patient with the help of a dental assistant.

Occupation

- Dentist
- Dental Surgeon
- Doctor

Names

[¹][^{nb 1}]

Occupation type

Profession

Activity sectors

Health care, Anatomy, Physiology, Pathology, Medicine, Pharmacology, Surgery

Description

Competencies

Education required

Dental Degree

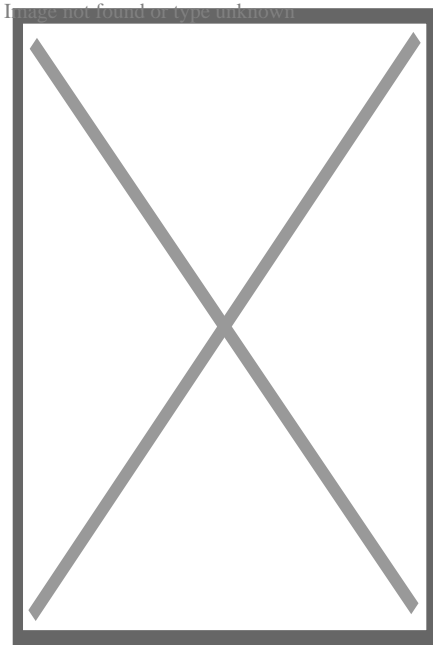
Fields of employment

Related jobs

ICD-9-CM 23-24

MeSH D003813

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An oral surgeon and dental assistant removing a wisdom tooth

Dentistry, also known as **dental medicine** and **oral medicine**, is the branch of medicine focused on the teeth, gums, and mouth. It consists of the study, diagnosis, prevention, management, and treatment of diseases, disorders, and conditions of the mouth, most commonly focused on dentition (the development and arrangement of teeth) as well as the oral mucosa.^[2] Dentistry may also encompass other aspects of the craniofacial complex including the temporomandibular joint. The practitioner is called a dentist.

The history of dentistry is almost as ancient as the history of humanity and civilization, with the earliest evidence dating from 7000 BC to 5500 BC.^[3] Dentistry is thought to have been the first specialization in medicine which has gone on to develop its own accredited degree with its own specializations.^[4] Dentistry is often also understood to subsume the now largely defunct medical specialty of stomatology (the study of the mouth and its disorders and diseases) for which reason the two terms are used interchangeably in certain regions. However, some specialties such as oral and maxillofacial surgery (facial reconstruction) may require both medical and dental degrees to accomplish. In European history, dentistry is considered to have stemmed from the trade of barber surgeons.^[5]

Dental treatments are carried out by a dental team, which often consists of a dentist and dental auxiliaries (such as dental assistants, dental hygienists, dental technicians, and dental therapists). Most dentists either work in private practices (primary care), dental hospitals, or (secondary care) institutions (prisons, armed forces bases, etc.).

The modern movement of evidence-based dentistry calls for the use of high-quality scientific research and evidence to guide decision-making such as in manual tooth

conservation, use of fluoride water treatment and fluoride toothpaste, dealing with oral diseases such as tooth decay and periodontitis, as well as systematic diseases such as osteoporosis, diabetes, celiac disease, cancer, and HIV/AIDS which could also affect the oral cavity. Other practices relevant to evidence-based dentistry include radiology of the mouth to inspect teeth deformity or oral malaises, haematology (study of blood) to avoid bleeding complications during dental surgery, cardiology (due to various severe complications arising from dental surgery with patients with heart disease), etc.

Terminology

[edit]

The term dentistry comes from *dentist*, which comes from French *dentiste*, which comes from the French and Latin words for tooth.^[6] The term for the associated scientific study of teeth is **odontology** (from Ancient Greek: ὀδοντολογία, romanized: *odoús*, lit. 'tooth') – the study of the structure, development, and abnormalities of the teeth.

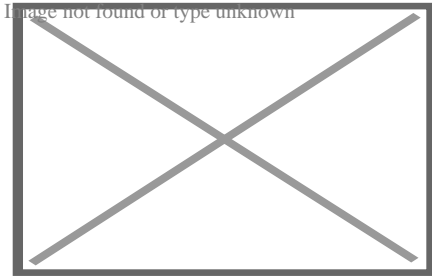
Dental treatment

[edit]

Dentistry usually encompasses practices related to the oral cavity.^[7] According to the World Health Organization, oral diseases are major public health problems due to their high incidence and prevalence across the globe, with the disadvantaged affected more than other socio-economic groups.^[8]

The majority of dental treatments are carried out to prevent or treat the two most common oral diseases which are dental caries (tooth decay) and periodontal disease (gum disease or pyorrhea). Common treatments involve the restoration of teeth, extraction or surgical removal of teeth, scaling and root planing, endodontic root canal treatment, and cosmetic dentistry^[9]

By nature of their general training, dentists, without specialization can carry out the majority of dental treatments such as restorative (fillings, crowns, bridges), prosthetic (dentures), endodontic (root canal) therapy, periodontal (gum) therapy, and extraction of teeth, as well as performing examinations, radiographs (x-rays), and diagnosis. Dentists can also prescribe medications used in the field such as antibiotics, sedatives, and any other drugs used in patient management. Depending on their licensing boards, general dentists may be required to complete additional training to perform sedation, dental implants, etc.



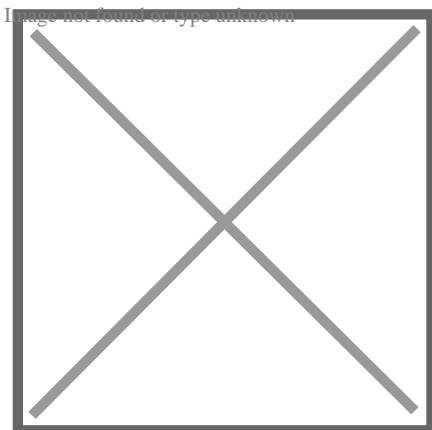
Irreversible enamel defects caused by an untreated celiac disease. They may be the only clue to its diagnosis, even in absence of gastrointestinal symptoms, but are often confused with fluorosis, tetracycline discoloration, acid reflux or other causes.^{[10][11][12]} The National Institutes of Health include a dental exam in the diagnostic protocol of celiac disease.^[10]

Dentists also encourage the prevention of oral diseases through proper hygiene and regular, twice or more yearly, checkups for professional cleaning and evaluation. Oral infections and inflammations may affect overall health and conditions in the oral cavity may be indicative of systemic diseases, such as osteoporosis, diabetes, celiac disease or cancer.^{[7][10][13][14]} Many studies have also shown that gum disease is associated with an increased risk of diabetes, heart disease, and preterm birth. The concept that oral health can affect systemic health and disease is referred to as "oral-systemic health".

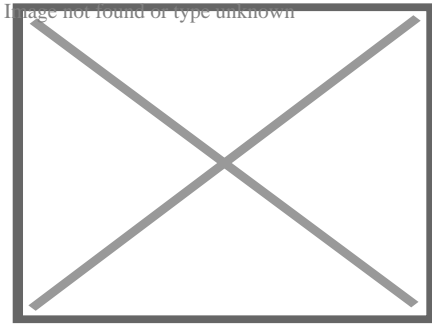
Education and licensing

[edit]

Main article: Dentistry throughout the world



A sagittal cross-section of a molar tooth; 1: crown, 2: root, 3: enamel, 4: dentin and dentin tubules, 5: pulp chamber, 6: blood vessels and nerve, 7: periodontal ligament, 8: apex and periapical region, 9: alveolar bone



Early dental chair in Pioneer West Museum in Shamrock, Texas

John M. Harris started the world's first dental school in Bainbridge, Ohio, and helped to establish dentistry as a health profession. It opened on 21 February 1828, and today is a dental museum.^[15] The first dental college, Baltimore College of Dental Surgery, opened in Baltimore, Maryland, US in 1840. The second in the United States was the Ohio College of Dental Surgery, established in Cincinnati, Ohio, in 1845.^[16] The Philadelphia College of Dental Surgery followed in 1852.^[17] In 1907, Temple University accepted a bid to incorporate the school.

Studies show that dentists that graduated from different countries,^[18] or even from different dental schools in one country,^[19] may make different clinical decisions for the same clinical condition. For example, dentists that graduated from Israeli dental schools may recommend the removal of asymptomatic impacted third molar (wisdom teeth) more often than dentists that graduated from Latin American or Eastern European dental schools.^[20]

In the United Kingdom, the first dental schools, the London School of Dental Surgery and the Metropolitan School of Dental Science, both in London, opened in 1859.^[21] The British Dentists Act of 1878 and the 1879 Dentists Register limited the title of "dentist" and "dental surgeon" to qualified and registered practitioners.^{[22][23]} However, others could legally describe themselves as "dental experts" or "dental consultants".^[24] The practice of dentistry in the United Kingdom became fully regulated with the 1921 Dentists Act, which required the registration of anyone practising dentistry.^[25] The British Dental Association, formed in 1880 with Sir John Tomes as president, played a major role in prosecuting dentists practising illegally.^[22] Dentists in the United Kingdom are now regulated by the General Dental Council.

In many countries, dentists usually complete between five and eight years of post-secondary education before practising. Though not mandatory, many dentists choose to complete an internship or residency focusing on specific aspects of dental care after they have received their dental degree. In a few countries, to become a qualified dentist one must usually complete at least four years of postgraduate study;^[26] Dental degrees awarded around the world include the Doctor of Dental Surgery (DDS) and Doctor of Dental Medicine (DMD) in North America (US and Canada), and the Bachelor

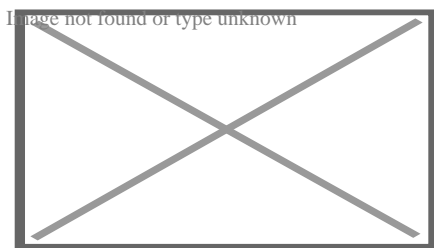
of Dental Surgery/Baccalaureus Dentalis Chirurgiae (BDS, BDent, BChD, BDS) in the UK and current and former British Commonwealth countries.

All dentists in the United States undergo at least three years of undergraduate studies, but nearly all complete a bachelor's degree. This schooling is followed by four years of dental school to qualify as a "Doctor of Dental Surgery" (DDS) or "Doctor of Dental Medicine" (DMD). Specialization in dentistry is available in the fields of Anesthesiology, Dental Public Health, Endodontics, Oral Radiology, Oral and Maxillofacial Surgery, Oral Medicine, Orofacial Pain, Pathology, Orthodontics, Pediatric Dentistry (Pedodontics), Periodontics, and Prosthodontics.^[27]

Specialties

[edit]

Main article: Specialty (dentistry)



A modern dental clinic in Lappeenranta, Finland

Some dentists undertake further training after their initial degree in order to specialize. Exactly which subjects are recognized by dental registration bodies varies according to location. Examples include:

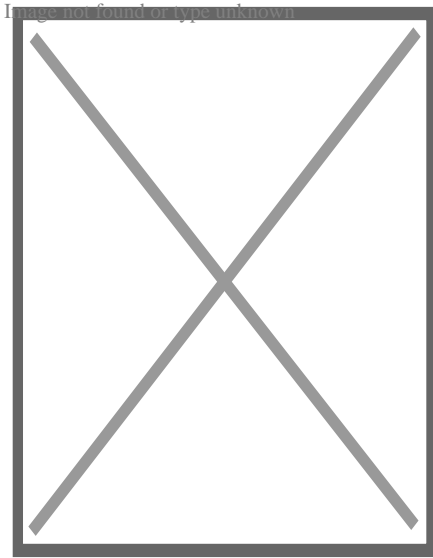
- Anesthesiology^[28] – The specialty of dentistry that deals with the advanced use of general anesthesia, sedation and pain management to facilitate dental procedures.
- Cosmetic dentistry – Focuses on improving the appearance of the mouth, teeth and smile.
- Dental public health – The study of epidemiology and social health policies relevant to oral health.
- Endodontics (also called *endodontology*) – Root canal therapy and study of diseases of the dental pulp and periapical tissues.
- Forensic odontology – The gathering and use of dental evidence in law. This may be performed by any dentist with experience or training in this field. The function of the forensic dentist is primarily documentation and verification of identity.
- Geriatric dentistry or *geriodontics* – The delivery of dental care to older adults involving the diagnosis, prevention, and treatment of problems associated with normal aging and age-related diseases as part of an interdisciplinary team with other health care professionals.

- Oral and maxillofacial pathology – The study, diagnosis, and sometimes the treatment of oral and maxillofacial related diseases.
- Oral and maxillofacial radiology – The study and radiologic interpretation of oral and maxillofacial diseases.
- Oral and maxillofacial surgery (also called *oral surgery*) – Extractions, implants, and surgery of the jaws, mouth and face.^[nb 2]
- Oral biology – Research in dental and craniofacial biology
- Oral Implantology – The art and science of replacing extracted teeth with dental implants.
- Oral medicine – The clinical evaluation and diagnosis of oral mucosal diseases
- Orthodontics and dentofacial orthopedics – The straightening of teeth and modification of midface and mandibular growth.
- Pediatric dentistry (also called *pedodontics*) – Dentistry for children
- Periodontology (also called *periodontics*) – The study and treatment of diseases of the periodontium (non-surgical and surgical) as well as placement and maintenance of dental implants
- Prosthodontics (also called *prosthetic dentistry*) – Dentures, bridges and the restoration of implants.
 - Some prosthodontists super-specialize in maxillofacial prosthetics, which is the discipline originally concerned with the rehabilitation of patients with congenital facial and oral defects such as cleft lip and palate or patients born with an underdeveloped ear (microtia). Today, most maxillofacial prosthodontists return function and esthetics to patients with acquired defects secondary to surgical removal of head and neck tumors, or secondary to trauma from war or motor vehicle accidents.
- Special needs dentistry (also called *special care dentistry*) – Dentistry for those with developmental and acquired disabilities.
- Sports dentistry – the branch of sports medicine dealing with prevention and treatment of dental injuries and oral diseases associated with sports and exercise. ^[29] The sports dentist works as an individual consultant or as a member of the Sports Medicine Team.
- Veterinary dentistry – The field of dentistry applied to the care of animals. It is a specialty of veterinary medicine.^{[30][31]}

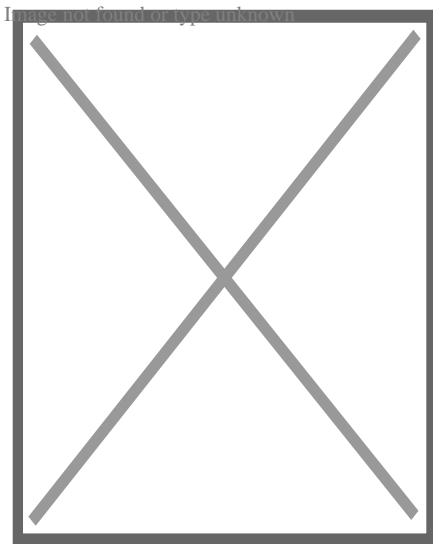
History

[edit]

See also: History of dental treatments



A wealthy patient falling over because of having a tooth extracted with such vigour by a fashionable dentist, c. 1790. History of Dentistry.



Farmer at the dentist, Johann Liss, c. 1616–17

Tooth decay was low in pre-agricultural societies, but the advent of farming society about 10,000 years ago correlated with an increase in tooth decay (cavities).^[32] An infected tooth from Italy partially cleaned with flint tools, between 13,820 and 14,160 years old, represents the oldest known dentistry,^[33] although a 2017 study suggests that 130,000 years ago the Neanderthals already used rudimentary dentistry tools.^[34] In Italy evidence dated to the Paleolithic, around 13,000 years ago, points to bitumen used to fill a tooth^[35] and in Neolithic Slovenia, 6500 years ago, beeswax was used to close a fracture in a tooth.^[36] The Indus valley has yielded evidence of dentistry being practised as far back as 7000 BC, during the Stone Age.^[37] The Neolithic site of Mehrgarh (now in Pakistan's south western province of Balochistan) indicates that this form of dentistry involved curing tooth related disorders with bow drills operated,

perhaps, by skilled bead-crafters.^[3] The reconstruction of this ancient form of dentistry showed that the methods used were reliable and effective.^[38] The earliest dental filling, made of beeswax, was discovered in Slovenia and dates from 6500 years ago.^[39] Dentistry was practised in prehistoric Malta, as evidenced by a skull which had a dental abscess lanced from the root of a tooth dating back to around 2500 BC.^[40]

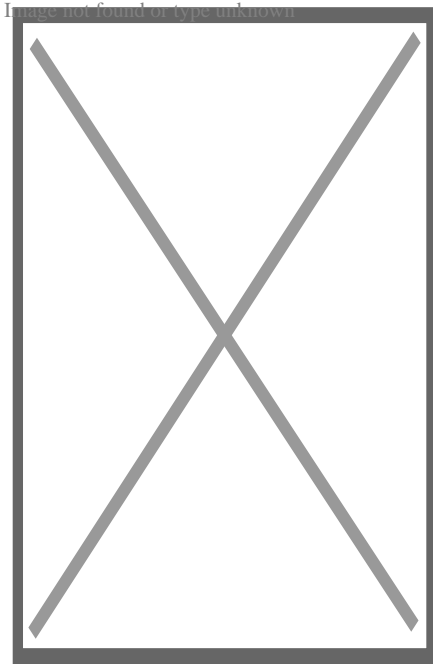
An ancient Sumerian text describes a "tooth worm" as the cause of dental caries.^[41] Evidence of this belief has also been found in ancient India, Egypt, Japan, and China. The legend of the worm is also found in the *Homeric Hymns*,^[42] and as late as the 14th century AD the surgeon Guy de Chauliac still promoted the belief that worms cause tooth decay.^[43]

Recipes for the treatment of toothache, infections and loose teeth are spread throughout the Ebers Papyrus, Kahun Papyri, Brugsch Papyrus, and Hearst papyrus of Ancient Egypt.^[44] The Edwin Smith Papyrus, written in the 17th century BC but which may reflect previous manuscripts from as early as 3000 BC, discusses the treatment of dislocated or fractured jaws.^{[44][45]} In the 18th century BC, the Code of Hammurabi referenced dental extraction twice as it related to punishment.^[46] Examination of the remains of some ancient Egyptians and Greco-Romans reveals early attempts at dental prosthetics.^[47] However, it is possible the prosthetics were prepared after death for aesthetic reasons.^[44]

Ancient Greek scholars Hippocrates and Aristotle wrote about dentistry, including the eruption pattern of teeth, treating decayed teeth and gum disease, extracting teeth with forceps, and using wires to stabilize loose teeth and fractured jaws.^[48] Use of dental appliances, bridges and dentures was applied by the Etruscans in northern Italy, from as early as 700 BC, of human or other animal teeth fastened together with gold bands.^{[49][50][51]} The Romans had likely borrowed this technique by the 5th century BC.^{[50][52]} The Phoenicians crafted dentures during the 6th–4th century BC, fashioning them from gold wire and incorporating two ivory teeth.^[53] In ancient Egypt, Hesy-Ra is the first named "dentist" (greatest of the teeth). The Egyptians bound replacement teeth together with gold wire. Roman medical writer Cornelius Celsus wrote extensively of oral diseases as well as dental treatments such as narcotic-containing emollients and astringents.^[54] The earliest dental amalgams were first documented in a Tang dynasty medical text written by the Chinese physician Su Kung in 659, and appeared in Germany in 1528.^{[55][56]}

During the Islamic Golden Age Dentistry was discussed in several famous books of medicine such as *The Canon in medicine* written by Avicenna and *Al-Tasreef* by Al-Zahrawi who is considered the greatest surgeon of the Middle Ages.^[57] Avicenna said that jaw fracture should be reduced according to the occlusal guidance of the teeth; this principle is still valid in modern times. Al-Zahrawi invented over 200 surgical tools that resemble the modern kind.^[58]

Historically, dental extractions have been used to treat a variety of illnesses. During the Middle Ages and throughout the 19th century, dentistry was not a profession in itself, and often dental procedures were performed by barbers or general physicians. Barbers usually limited their practice to extracting teeth which alleviated pain and associated chronic tooth infection. Instruments used for dental extractions date back several centuries. In the 14th century, Guy de Chauliac most probably invented the dental pelican^[59] (resembling a pelican's beak) which was used to perform dental extractions up until the late 18th century. The pelican was replaced by the dental key^[60] which, in turn, was replaced by modern forceps in the 19th century.^[61]



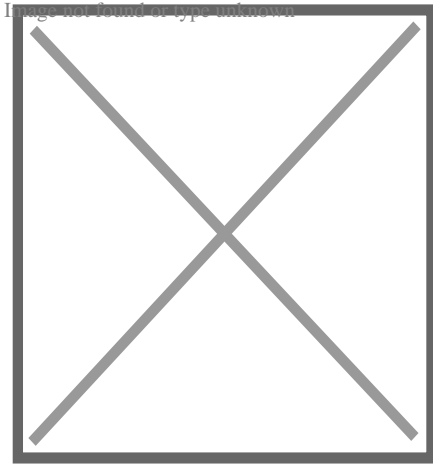
Dental needle-nose pliers designed by Fauchard in the late 17th century to use in prosthodontics

The first book focused solely on dentistry was the "Artzney Buchlein" in 1530,^[48] and the first dental textbook written in English was called "Operator for the Teeth" by Charles Allen in 1685.^[23]

In the United Kingdom, there was no formal qualification for the providers of dental treatment until 1859 and it was only in 1921 that the practice of dentistry was limited to those who were professionally qualified. The Royal Commission on the National Health Service in 1979 reported that there were then more than twice as many registered dentists per 10,000 population in the UK than there were in 1921.^[62]

Modern dentistry

[edit]

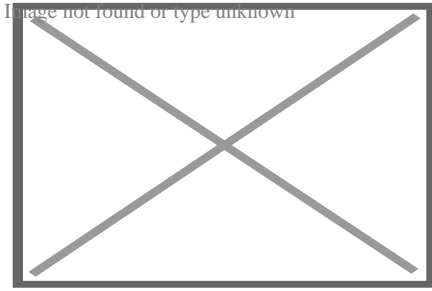


A microscopic device used in dental analysis, c. 1907

It was between 1650 and 1800 that the science of modern dentistry developed. The English physician Thomas Browne in his *A Letter to a Friend* (c. 1656 pub. 1690) made an early dental observation with characteristic humour:

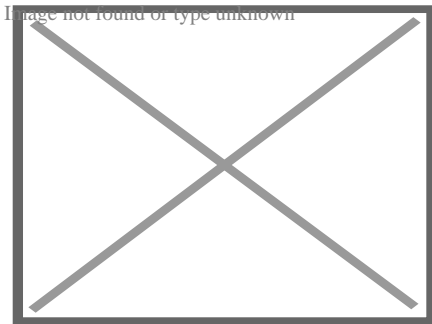
The Egyptian Mummies that I have seen, have had their Mouths open, and somewhat gaping, which affordeth a good opportunity to view and observe their Teeth, wherein 'tis not easie to find any wanting or decayed: and therefore in Egypt, where one Man practised but one Operation, or the Diseases but of single Parts, it must needs be a barren Profession to confine unto that of drawing of Teeth, and little better than to have been Tooth-drawer unto King Pyrrhus, who had but two in his Head.

The French surgeon Pierre Fauchard became known as the "father of modern dentistry". Despite the limitations of the primitive surgical instruments during the late 17th and early 18th century, Fauchard was a highly skilled surgeon who made remarkable improvisations of dental instruments, often adapting tools from watchmakers, jewelers and even barbers, that he thought could be used in dentistry. He introduced dental fillings as treatment for dental cavities. He asserted that sugar-derived acids like tartaric acid were responsible for dental decay, and also suggested that tumors surrounding the teeth and in the gums could appear in the later stages of tooth decay.^{[63][64]}



Panoramic radiograph of historic dental implants, made 1978

Fauchard was the pioneer of dental prosthesis, and he invented many methods to replace lost teeth. He suggested that substitutes could be made from carved blocks of ivory or bone. He also introduced dental braces, although they were initially made of gold, he discovered that the teeth position could be corrected as the teeth would follow the pattern of the wires. Waxed linen or silk threads were usually employed to fasten the braces. His contributions to the world of dental science consist primarily of his 1728 publication *Le chirurgien dentiste* or *The Surgeon Dentist*. The French text included "basic oral anatomy and function, dental construction, and various operative and restorative techniques, and effectively separated dentistry from the wider category of surgery".^{[63][64]}



A modern dentist's chair

After Fauchard, the study of dentistry rapidly expanded. Two important books, *Natural History of Human Teeth* (1771) and *Practical Treatise on the Diseases of the Teeth* (1778), were published by British surgeon John Hunter. In 1763, he entered into a period of collaboration with the London-based dentist James Spence. He began to theorise about the possibility of tooth transplants from one person to another. He realised that the chances of a successful tooth transplant (initially, at least) would be improved if the donor tooth was as fresh as possible and was matched for size with the recipient. These principles are still used in the transplantation of internal organs. Hunter conducted a series of pioneering operations, in which he attempted a tooth transplant. Although the donated teeth never properly bonded with the recipients' gums, one of Hunter's patients stated that he had three which lasted for six years, a remarkable achievement for the period.^[65]

Major advances in science were made in the 19th century, and dentistry evolved from a trade to a profession. The profession came under government regulation by the end of the 19th century. In the UK, the Dentist Act was passed in 1878 and the British Dental Association formed in 1879. In the same year, Francis Brodie Imlach was the first ever dentist to be elected President of the Royal College of Surgeons (Edinburgh), raising dentistry onto a par with clinical surgery for the first time.^[66]

Hazards in modern dentistry

[edit]

Main article: Occupational hazards in dentistry

Long term occupational noise exposure can contribute to permanent hearing loss, which is referred to as noise-induced hearing loss (NIHL) and tinnitus. Noise exposure can cause excessive stimulation of the hearing mechanism, which damages the delicate structures of the inner ear.^[67] NIHL can occur when an individual is exposed to sound levels above 90 dBA according to the Occupational Safety and Health Administration (OSHA). Regulations state that the permissible noise exposure levels for individuals is 90 dBA.^[68] For the National Institute for Occupational Safety and Health (NIOSH), exposure limits are set to 85 dBA. Exposures below 85 dBA are not considered to be hazardous. Time limits are placed on how long an individual can stay in an environment above 85 dBA before it causes hearing loss. OSHA places that limitation at 8 hours for 85 dBA. The exposure time becomes shorter as the dBA level increases.

Within the field of dentistry, a variety of cleaning tools are used including piezoelectric and sonic scalers, and ultrasonic scalers and cleaners.^[69] While a majority of the tools do not exceed 75 dBA,^[70] prolonged exposure over many years can lead to hearing loss or complaints of tinnitus.^[71] Few dentists have reported using personal hearing protective devices,^[72]^[73] which could offset any potential hearing loss or tinnitus.

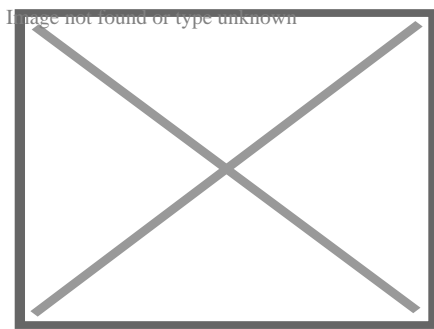
Evidence-based dentistry

[edit]

Main article: Evidence-based dentistry

There is a movement in modern dentistry to place a greater emphasis on high-quality scientific evidence in decision-making. Evidence-based dentistry (EBD) uses current

scientific evidence to guide decisions. It is an approach to oral health that requires the application and examination of relevant scientific data related to the patient's oral and medical health. Along with the dentist's professional skill and expertise, EBD allows dentists to stay up to date on the latest procedures and patients to receive improved treatment. A new paradigm for medical education designed to incorporate current research into education and practice was developed to help practitioners provide the best care for their patients.^[74] It was first introduced by Gordon Guyatt and the Evidence-Based Medicine Working Group at McMaster University in Ontario, Canada in the 1990s. It is part of the larger movement toward evidence-based medicine and other evidence-based practices, especially since a major part of dentistry involves dealing with oral and systemic diseases. Other issues relevant to the dental field in terms of evidence-based research and evidence-based practice include population oral health, dental clinical practice, tooth morphology etc.



A dental chair at the University of Michigan School of Dentistry


Ethical and medicolegal issues

[edit]

Dentistry is unique in that it requires dental students to have competence-based clinical skills that can only be acquired through supervised specialized laboratory training and direct patient care.^[75] This necessitates the need for a scientific and professional basis of care with a foundation of extensive research-based education.^[76] According to some experts, the accreditation of dental schools can enhance the quality and professionalism of dental education.^{[77][78]}

See also

[edit]

-  [Medicine portal](#)
- [Dental aerosol](#)
- [Dental instrument](#)
- [Dental public health](#)
- [Domestic healthcare:](#)

- Dentistry in ancient Rome
- Dentistry in Canada
- Dentistry in the Philippines
- Dentistry in Israel
- Dentistry in the United Kingdom
- Dentistry in the United States
- Eco-friendly dentistry
- Geriatric dentistry
- List of dental organizations
- Pediatric dentistry
- Sustainable dentistry
- Veterinary dentistry

Notes

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1. ^ Whether Dentists are referred to as "Doctor" is subject to geographic variation. For example, they are called "Doctor" in the US. In the UK, dentists have traditionally been referred to as "Mister" as they identified themselves with barber surgeons more than physicians (as do surgeons in the UK, see Surgeon#Titles). However more UK dentists now refer to themselves as "Doctor", although this was considered to be potentially misleading by the British public in a single report (see Costley and Fawcett 2010).
2. ^ The scope of oral and maxillofacial surgery is variable. In some countries, both a medical and dental degree is required for training, and the scope includes head and neck oncology and craniofacial deformity.

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
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Dentistry

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- Oral and maxillofacial radiology
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Cleft lip and cleft palate

Related specialities

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- Dentistry
- Dietetics
- Genetics
- Oral and maxillofacial surgery
- Orthodontics
- Orthodontic technology
- Otolaryngology
- Pediatrics
- Pediatric dentistry
- Physician
- Plastic surgery
- Psychiatry
- Psychology
- Respiratory therapy
- Social work
- Speech and language therapy
- Hearing loss with craniofacial syndromes
- Pierre Robin syndrome
- Popliteal pterygium syndrome
- Van der Woude syndrome

Related syndromes

National and international organisations

- Cleft Lip and Palate Association
- Craniofacial Society of Great Britain and Ireland
- Interplast
- North Thames Regional Cleft Lip and Palate Service
- Operation Smile
- Overseas Plastic Surgery Appeal
- Shriners Hospitals for Children
- Smile Train
- Transforming Faces Worldwide
- Smile Angel Foundation (China)

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Dental schools

**American
dental
schools**

- UAB
- Arizona
- Augusta (DCG)
- Boston U (Goldman)
- California (UCLA, UCSF)
- Case Western Reserve
- Colorado
- Columbia
- Connecticut
- Creighton
- Detroit Mercy
- East Carolina
- Florida
- Harvard
- Howard
- Illinois–Chicago
- Indiana
- Iowa
- Kentucky
- Lake Erie
- Loma Linda
- Louisville
- LSU Health–New Orleans
- Marquette
- Maryland–Baltimore
- Meharry
- Michigan
- Midwestern
- Minnesota
- Mississippi
- Missouri–Kansas City
- Nebraska–Medical Center
- Nevada–Las Vegas
- New England
- NYU
- SUNY (Buffalo, Stony Brook)
- North Carolina
- Nova
- Ohio State
- Oklahoma
- Oregon
- Pacific (Dugoni)
- Penn
- Pitt
- Puerto Rico
- Rochester
- Pacific Northwest
- Rutgers

**Defunct
American
dental
schools**

- Emory
- Fairleigh Dickinson
- Georgetown
- Harris
- Loyola
- Northwestern
- Ohio College
- Oral Roberts
- Pennsylvania College
- Wash U

**Canadian
dental
schools**

- Alberta
- British Columbia
- Dalhousie
- Laval
- Manitoba
- McGill
- Montréal
- Saskatchewan
- Toronto
- Western

**British
dental
schools**

- Aberdeen
- Barts and The London School of Medicine and Dentistry
- Glasgow
- Guy's, King's & St Thomas's
- Liverpool
- Newcastle
- Peninsula College of Medicine and Dentistry
- UCL Eastman Dental Institute
- Sydney
- Melbourne

**Australian
and New
Zealand
dental
schools**

- Adelaide
- Charles Sturt University
- Griffith University
- James Cook
- La Trobe
- Queensland
- Western Australia
- University of Otago

**South
Korean
dental
schools**

- Chonbuk
- Chonnam
- Chosun
- Dankook
- Gangneung-Wonju
- Kyung Hee
- Kyungpook
- Pusan
- Seoul
- Wonkwang
- Yonsei

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Medicine

	<ul style="list-style-type: none"> ○ Cardiac surgery ○ Cardiothoracic surgery ○ Endocrine surgery ○ Eye surgery ○ General surgery <ul style="list-style-type: none"> ○ Colorectal surgery ○ Digestive system surgery ○ Neurosurgery ○ Oral and maxillofacial surgery ○ Orthopedic surgery
Surgery	<ul style="list-style-type: none"> ○ Hand surgery ○ Otolaryngology <ul style="list-style-type: none"> ○ ENT ○ Pediatric surgery ○ Plastic surgery ○ Reproductive surgery ○ Surgical oncology ○ Transplant surgery ○ Trauma surgery ○ Urology <ul style="list-style-type: none"> ○ Andrology ○ Vascular surgery ○ Allergy / Immunology ○ Angiology ○ Cardiology ○ Endocrinology ○ Gastroenterology <ul style="list-style-type: none"> ○ Hepatology
Internal medicine	<ul style="list-style-type: none"> ○ Geriatrics ○ Hematology ○ Hospital medicine ○ Infectious diseases ○ Nephrology ○ Oncology ○ Pulmonology ○ Rheumatology ○ Gynaecology ○ Gynecologic oncology
Obstetrics and gynaecology	<ul style="list-style-type: none"> ○ Maternal–fetal medicine ○ Obstetrics ○ Reproductive endocrinology and infertility ○ Urogynecology ○ Radiology <ul style="list-style-type: none"> ○ Interventional radiology ○ Neuroradiology ○ Nuclear medicine
Specialties	<ul style="list-style-type: none"> ○ Pathology

Medical education

- Medical school
- Bachelor of Medicine, Bachelor of Surgery
- Bachelor of Medical Sciences
- Master of Medicine
- Master of Surgery
- Doctor of Medicine
- Doctor of Osteopathic Medicine
- MD–PhD
 - Medical Scientist Training Program
- Alternative medicine
- Allied health
- Molecular oncology
- Nanomedicine
- Personalized medicine
- Public health
- Rural health
- Therapy
- Traditional medicine
- Veterinary medicine
- Physician
 - Chief physician
- History of medicine

Related topics

-  **Category**
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- NARA

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- **Factors Influencing Variations in Treatment Pricing**
- **Identifying Red Flags in Unsupervised Orthodontic Options**
- **Balancing Innovation With Patient Protection**

Frequently Asked Questions

Will my dental insurance cover any part of the orthodontic treatment?

Many dental insurance plans cover 25-50% of orthodontic treatment for children, usually up to a maximum lifetime benefit of \$1,500-\$2,500.

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