Accelerated Orthodontics

- **Innovative Approaches to Shorten Treatment Time**
  Innovative Approaches to Shorten Treatment Time The Role of Vibration Devices in Faster Tooth Movement Micro Osteoperforation and Its Effects on Treatment 3D Printing Techniques for Customized Appliances Benefits of Digital Impressions in Modern Orthodontics AI Assisted Treatment Planning for Precise Outcomes Remote Monitoring and Virtual Consultations Incorporating New Tools for Patient Compliance Practical Considerations of Accelerated Techniques Research Trends Shaping Future Orthodontic Practices Combining Traditional Methods With Cutting Edge Solutions Adapting to Technological Shifts in Orthodontic Care
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The importance of skeletal analysis in orthodontic treatment, especially before surgery, can't be overwized. It is a comprehensive tool that provides a detailed evaluation of the proportions of the facial skeleton, which is particularly critical for children. This analysis is essential for ensuring that any treatment, including surgery, is both appropriate and effective.

When it's about children, the timing and type of intervention are critical. Skeletal analysis, through the use of cephalometry and other diagnostic records, can help identify growth patterns and anomalies early on. This early diagnosis is beneficial in managing developing dentition and occlusion, which are essential components of comprehensive oral health care. Thumb-sucking habits can affect the alignment of a child's teeth **Braces for kids and teens** dental caries. It also facilitates interceptive orthodontic treatments that can correct or improve adverse growth patterns before they become more severe[2][3]. For example, in cases of skeletal Class III malocclusion, early analysis can determine whether orthodontic camouflage or surgical intervention is necessary, ensuring that the treatment plan is optimized for the patient's specific needs[1][3]. This not only prevents future malocclusions but also provides the best possible aesthetic and functional outcomes.

The process of skeletal analysis is thorough and includes both two- and three- dimensional evaluations. It can be based on plain X-rays or more detailed imaging like 3D reformatted CT scans. These diagnostic images help in planning orthognathic surgery by determining the precise movements needed to correct skeletal deformities. Mock surgery on models of the patient's jaw can also be performed to visualize and demonstrate the planned surgical outcomes, ensuring that both the surgeon and orthodontist are on the same page[3]. This interdisciplinary coordination is essential for achieving long-term stability and avoiding relapse.

The use of skeletal analysis also facilitates patient and parent informed consent by clearly presenting the treatment options and expected outcomes. This is especially important in pediatric cases where the patient's growth and development are ongoing, and the treatment plan must be both effective and appropriate for their age and condition[2]. In summary, skeletal analysis is a critical tool in orthodontic treatment planning, particularly before surgery, as it provides a comprehensive assessment of the facial skeleton and facilitates effective and appropriate interventions.

The importance of skeletal analysis before surgery, particularly in the planning of orthognathic procedures, cannot be overemized. Orthognathic surgery is a complex process that requires precise diagnosis and planning to correct skeletal deformities of the jaws, ensuring both

functional and esthetical outcomes. This analysis, which includes cephalometric X-rays and 3D CT scans, provides detailed information about the patient's bone and dental alignment, which is crucial for determining the need for surgery and for crafting an effective treatment plan.

Cephalometric X-rays are a fundamental tool in this process. They provide a side view of the face, showcasing the relationship between the teeth and jaws. This imaging is invaluable for understanding the patient's skeletal structure and planning tooth movement. By using cephalometric analysis, orthodontists and oral maxillofacial surgeon can assess the proportions of the facial skeleton and compare them to standard norms, helping to identify any discrepancies that need correction.

3D CT scans further enhance this analysis by offering a comprehensive, three-dimensional view of the patient's skull. This detailed imaging includes not only bone structure but also soft tissues, nerve pathways, and other critical anatomical features. The use of 3D CT scans is particularly important for complex cases, such as asymmetric deformities, where precise planning is essential to achieve optimal results.

The data obtained from these imaging techniques are used to create personalized treatment plans. By understanding the patient's unique anatomy, orthodontists and oral maxillofacial surgeon can design surgical interventions that address specific needs, such as aligning the jaws correctly or repositioning dental arches. This tailored approach not only aids in achieving functional occlusion but also in achieving facial harmony and aesthetics, which are often significant factors for patients undergoing orthognathic surgery.

In planning orthognathic surgery, mock surgery is often performed using the data from these analyses. This process, which can be done with traditional models or using 3D printed models, is a powerful tool for both the treatment planning and patient consultation. It enables the surgical and orthodontic treatment to be visually represented, helping patients understand the proposed changes and expected outcomes.

In short, skeletal analysis through cephalometric X-rays and 3D CT scans is a cornerstone of orthognathic surgery planning. It provides the necessary insights into the patient's anatomy, ensuring that any surgical interventions are well- planned, precise, and tailored to achieve the best possible outcomes.

The HealthyStart System

Skeletal analysis is a crucial step in orthodontic treatment, particularly for identifying potential skeletal malocclusions in young patients. One common type of skeletal malocclusion is Class III malocclusion, where the lower jaw protrudes beyond the upper jaw, resulting in an underbite. This type of malocclusion often requires a combination of surgical intervention and orthodontic treatment to achieve optimal results.

The importance of skeletal analysis lies in understanding the structural discrepancies between the upper and lower jaws. This involves detailed diagnostic tools such as cephalometric X-rays and 3D imaging, which provide comprehensive information about jaw positioning and growth patterns. By identifying these discrepancies early, orthodontists and maxillofacial surgeon can plan a tailored treatment approach that may include growth modification appliances for growing patients or orthognathic surgery for more severe cases.

Orthognathic surgery, often performed in combination with orthodontics, is particularly effective for treating severe skeletal malocclusions like Class III. This approach not only corrects the jaw alignment but also significantly improve facial aesthetics and masticatory function. The success of such treatments depends on a well- planned interdisciplinary approach between orthodontists and maxillofacial surgeon, ensuring that both aesthetic and functional objectives are met.

Skeletal analysis also helps in assessing the potential need for surgical intervention early on, which can be critical in preventing more severe issues later in a patient's dental and facial growth. By understanding the structural issues at play, professionals can provide more accurate treatment outcomes and better patient management, leading to improved long-term stability and aesthetic results. In cases where surgery is necessary, the use of mock surgery and virtual planning tools can help visualize and discuss treatment outcomes with patients, ensuring that all parties are well-informed and on the same treatment plan.

While nonsurgical treatments can be effective for some patients, particularly adolescents who may reject surgery, the combination of orthodontics and surgery often provides the most comprehensive and long-term solution for severe skeletal malocclusions. This approach not

only corrects the structural issues but also helps in achieving a more ideal occlusion and facial balance, which are essential for both functional and aesthetic outcomes.

This non-invasive approach targets the natural development of children's teeth and jaw, using soft

dental appliances to align teeth and address breathing issues, reducing the need for more invasive treatments.

The combination of orthodontics and surgery is a powerful tool in addressing skeletal malocclusions, offering both aesthetic and functional benefits that are crucial for long-term stability and reducing the risk of relapse. This is particularly significant in children's treatment, where early intervention can guide jaw and facial growth, creating a foundation for a healthy and aligned smile.

Orthodontic treatment plays a crucial role in aligning teeth and jaws properly, which not only enhances the appearance of the smile but also improves the overall function of the bite. By addressing orthodontic issues early on, further complications such as impacted teeth, overcrowding, and bite issues can be minimized or even prevented. This early intervention is especially important in children, as their growing bodies offer a window of opportunity to effectively address potential issues before they become more severe.

When it comes to skeletal malocclusions, such as Class III malocclusion, a comprehensive analysis is necessary to plan effective treatment. Cephalometric analysis, which includes evaluating the proportions of the facial skeleton using X-rays or 3D CT scans, is a gold standard in evaluating soft and hard tissues before orthodontic treatment. This analysis allows for the assessment of skeletal anomalies and the planning of orthognathic surgery, which can correct maxillomandibular differences and improve facial aesthetics and masticatory function.

The planning of orthognathic surgery is a combined endeavor between orthodontists and maxillofacial surgeon, where mock surgery and 3D models are used to mimic the planned surgical procedure. This not only demonstrates the treatment plan to the patient but also allows for precise surgical splints to be designed and printed using CAD-CAM technology.

The success of the treatment depends on a good interdisciplinary relationship between the orthodontist and the maxillofacial surgeon. Bimaxillary orthognathic surgery, for example, presents greater stability in the long term, offering better aesthetic and functional results. By aligning the teeth and jaws properly, the risk of future dental problems is reduced, and the benefits of treatment can be enjoyed for a lifetime.

Early skeletal analysis is crucial for identifying potential issues and planning appropriate treatment. It allows for the assessment of maxillomandibular differences and the development of a treatment plan that can address these issues effectively. By taking advantage of growth potential in children, skeletal anomalies can sometimes be corrected or reduced, promoting normal dental and skeletal growth.

The combination of orthodontics and surgery provides a comprehensive treatment plan that not only improves facial aesthetics but also enhances functional outcomes. It is an investment in oral health and overall well-being, offering long-term stability and reducing the risk of relapse. This makes it a significant consideration in children's treatment, where early intervention can set the stage for a lifetime of improved oral health and enhanced self-esteem.

Myobrace: A No-Braces Approach

S skeletal analysis is a crucial step in the planning of orthognathic surgery, as it provides a detailed understanding of the facial structure and its potential for improvement. This analysis is essential for developing a comprehensive treatment plan that not only enhances facial aesthetics but also rectify occlusal issues, which are critical for both the psychological and physiological well being of children.

When children have skeletal discrepancies, such as jaw malaligns, it can impact their overall quality of life. These discrepancies can result in malocclusion, which is a condition where the upper and lower teeth do not align properly. This can cause discomfort, pain, and even psychological issues due to aesthetic concerns. A thorough skeletal analysis, often using

cephalometric measurements, can help orthodontists and oral maxilla facial (Omf) surgeon to understand the extent of these discrepancies and plan the necessary surgical and orthodontic treatments.

The COGS analysis, for example, is a specialized system used in orthognathic surgery to evaluate the hard tissue in the face. It provides detailed information about the horizontal and vertical positions of the facial bones, which is crucial for planning surgical procedures. This analysis also includes soft tissue evaluation to ensure that the treatment outcomes align with the patient's aesthetic expectations.

The use of 3D-imaging and mock surgery further enhances the planning process. These models allow for the precise repositioning of the jaws and the prediction of post-surgery outcomes, including changes in facial aesthetics and occlusion. This not only aids in the communication with the patient about potential outcomes but also in the actual surgical procedure, ensuring that the treatment objectives are met effectively.

S skeletal analysis is not just about improving aesthetics; it also has a significant impact on the physiological well being of children. Malocclusion can increase the risk of dental problems like premature wear, tooth loss, and gum disease. It can also contribute to issues such as temporomandibular disorder (TMD) and discomfort in the jaw. A detailed treatment plan based on skeletal analysis can address these issues by ensuring proper alignment of the teeth and jaws, which in the long term, can improve oral hygiene, reduce the risk of dental complications, and enhance overall health.

The psychological benefits of skeletal analysis and orthognathic surgery should not be underestimatted. For children, a more normal facial appearance can improve confidence and reduce social anxiety related to their appearance. This can have a significant impact on their psychological well being and social life, as they are more likely to engage in social and academic life without the discomfort of aesthetic concerns.

To summarize, a detailed treatment plan based on skeletal analysis is crucial for ensuring that orthognathic surgery not only enhances facial aesthetics but also provides significant physiological and psychological benefits. It is a comprehensive tool that aids in precise diagnosis and treatment planning, which are essential for improving the quality of life for children with skeletal discrepancies.

Myobrace offers a brace-free solution that corrects poor oral habits, guiding jaw and teeth alignment development in children, promoting natural growth and oral health.

The importance of thorough preoperative assessment, particularly in the form of detailed bone density and structure evaluation, is paramount in planning surgical treatments. This is especially crucial in orthopedic and spinal surgeries, where understanding the patient's bone health can significantly affect surgical outcomes and the risk of complications such as fractures or implant failures[1][3]. However, the use of mock surgery and virtual models can also be a critical tool in this process, offering both patients and medical teams a clear and detailed understanding of the proposed treatment outcomes.

In the specific contexts of children's orthodontic and surgical care, such as cleft lip and palate repair, the use of mock surgery and virtual models can be particularly beneficial. These techniques provide a precise and detailed forecast of how the treatment will affect the child's facial structure and dental positioning. This not only helps in planning the most appropriate surgical strategy but also in ensuring that both the patient and their care team are well-prepared and aligned in their understanding of the treatment's outcomes.

Virtual surgical planning can significantly improve the consent process by providing a clear and comprehensive understanding of what the surgery will aim to change and how it will be

performed. This clarity can help in all types of surgical planning, including orthognathic surgery, where patient-specific osteosynthesis plates are used to improve outcomes[2]. In children, where the bone is more complex and less dense, understanding the precise changes that will be needed and how they will affect the child's future development is crucial.

In the end, the use of mock surgery and virtual models in planning children's orthodontic and surgical care represents a significant step in optimizing treatment outcomes and ensuring that both patients and their care teams are well-prepared for the surgery. This not only helps in improving surgical success rates but also in providing a more comprehensive and patient-specific care experience.

Comprehensive Orthodontic Solutions

The importance of skeletal analysis before surgery cannot be overemphasized, especially in the treatment of dental and facial anomalies. Skeletal analysis provides a comprehensive evaluation of the facial skeleton, which is crucial for planning orthognathic surgery. This type of surgery is often necessary for correcting severe jaw irregularities that cannot be fully corrected with orthodontics alone, such as significant underbite, overbite, or facial asymmetry.

In the process of skeletal analysis, various imaging and analysis are used, including cephalometric X-rays and 3D CT scans. These imaging and analysis help in the precise evaluation of the facial skeleton's proportions and alignment. The data obtained from these images are analyzed using computer programs that help in planning the surgical intervention by highlighting the specific movements needed to correct skeletal discrepancies.

The planning process involves not only the surgeon but also the orthodontist, as both need to align their objectives to achieve optimal results. The treatment plan is developed based on a thorough clinical examination, facial photographs, and detailed imaging. This interdisciplinary approach ensures that both the aesthetic and functional outcomes are optimized.

After surgery, skeletal analysis also provides a basis for long-term follow-up and assessment of treatment outcomes. It helps in monitoring the stability of the surgical results and ensures that any necessary post-surgical orthodontic care is provided promptly. This follow-up is crucial for fine-turing the alignment of the teeth and ensuring that the bite is perfect, which is often achieved through additional orthodontic treatment after surgery.

In summary, skeletal analysis is a critical tool in the management of skeletal malocclusions. It not only guides the surgical planning but also ensures that post-surgical care is optimized to achieve the best functional and aesthetic results. The combination of thorough pre-surgical planning and post-surgical follow-up based on skeletal analysis is what makes orthognathic surgery so successful in correcting facial anomalies and ensuring long-term stability.

About child

"Children" and "Childhood" redirect here. For other uses, see Child (disambiguation), Children (disambiguation), and Childhood (disambiguation).

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International children in traditional clothing at Liberty Weekend

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Part of a series on

Human growth and development

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Stages

- Gamete
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A **child** (pl. **children**) is a human being between the stages of birth and puberty,[1][2] or between the developmental period of infancy and puberty.[3] The term may also refer to an unborn human being.[4][5] In English-speaking countries, the legal definition of *child* generally refers to a minor, in this case as a person younger than the local age of majority (there are exceptions like, for example, the consume and purchase of alcoholic beverage even after said age of majority[6]), regardless of their physical, mental and sexual development as biological adults.[1][7][8] Children generally have fewer rights and responsibilities than adults. They are generally classed as unable to make serious decisions.

Child may also describe a relationship with a parent (such as sons and daughters of any age)[9] or, metaphorically, an authority figure, or signify group membership in a clan, tribe, or religion; it can also signify being strongly affected by a specific time, place, or circumstance, as in "a child of nature" or "a child of the Sixties."[10]

Biological, legal and social definitions

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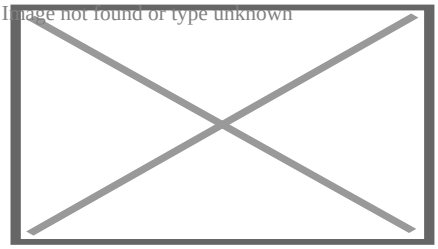

Children playing ball games, Roman artwork, 2nd century AD

In the biological sciences, a child is usually defined as a person between birth and puberty,[1][2] or between the developmental period of infancy and puberty.[3] Legally, the term *child* may refer to anyone below the age of majority or some other age limit.

The United Nations Convention on the Rights of the Child defines *child* as, "A human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier."[11] This is ratified by 192 of 194 member countries. The term *child* may also refer to someone below another legally defined age limit unconnected to the age of majority. In Singapore, for example, a *child* is legally defined as someone under the age of 14 under the "Children and Young Persons Act" whereas the age of majority is 21.[12][13] In U.S. Immigration Law, a child refers to anyone who is under the age of 21.[14]

Some English definitions of the word *child* include the fetus (sometimes termed *the unborn*).[15] In many cultures, a child is considered an adult after undergoing a rite of passage, which may or may not correspond to the time of puberty.

Children generally have fewer rights than adults and are classed as unable to make serious decisions, and legally must always be under the care of a responsible adult or child custody, whether their parents divorce or not.

Developmental stages of childhood

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Further information: Child development stages and Child development

Early childhood

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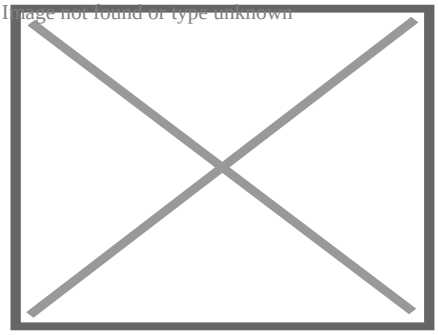
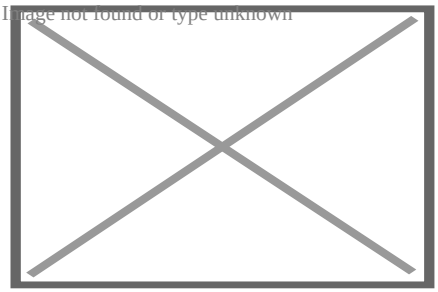
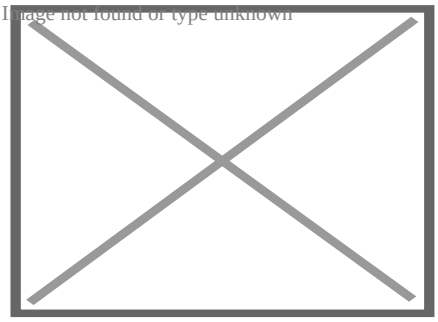


Children playing the violin in a group recital, Ithaca, New York, 2011



Children in Madagascar, 2011



Child playing piano, 1984

Early childhood follows the infancy stage and begins with toddlerhood when the child begins speaking or taking steps independently.[16][17] While toddlerhood ends around age 3 when the child becomes less dependent on parental assistance for basic needs, early childhood continues approximately until the age of 5 or 6. However, according to the National Association for the Education of Young Children, early childhood also includes infancy. At this stage children are learning through observing, experimenting and communicating with others. Adults supervise and support the development process of the child, which then will lead to the child's autonomy. Also during this

stage, a strong emotional bond is created between the child and the care providers. The children also start preschool and kindergarten at this age: and hence their social lives.

Middle childhood

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Middle childhood begins at around age 7, and ends at around age 9 or 10.[18] Together, early and middle childhood are called formative years. In this middle period, children develop socially and mentally. They are at a stage where they make new friends and gain new skills, which will enable them to become more independent and enhance their individuality. During middle childhood, children enter the school years, where they are presented with a different setting than they are used to. This new setting creates new challenges and faces for children.[19] Upon the entrance of school, mental disorders that would normally not be noticed come to light. Many of these disorders include: autism, dyslexia, dyscalculia, and ADHD.[20] :Ã¢â‚¬Å 303–309Ã¢â‚¬Å Special education, least restrictive environment, response to intervention and individualized education plans are all specialized plans to help children with disabilities.[20]:Ã¢â‚¬Å 310–311Ã¢â‚¬Å

Middle childhood is the time when children begin to understand responsibility and are beginning to be shaped by their peers and parents. Chores and more responsible decisions come at this time, as do social comparison and social play.[20] :Ã¢â‚¬Å 338Ã¢â‚¬Å During social play, children learn from and teach each other, often through observation.[21]

Late childhood

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Main article: Preadolescence

Preadolescence is a stage of human development following early childhood and preceding adolescence. Preadolescence is commonly defined as ages 9–12, ending with the major onset of puberty, with markers such as menarche, spermarche, and the peak of height velocity occurring. These changes usually occur between ages 11 and 14. It may also be defined as the 2-year period before the major onset of puberty.[22] Preadolescence can bring its own challenges and anxieties. Preadolescent children

have a different view of the world from younger children in many significant ways. Typically, theirs is a more realistic view of life than the intense, fantasy-oriented world of earliest childhood. Preadolescents have more mature, sensible, realistic thoughts and actions: 'the most "sensible" stage of development...the child is a much *less emotional being* now.'[23] Preadolescents may well view human relationships differently (e.g. they may notice the flawed, human side of authority figures). Alongside that, they may begin to develop a sense of self-identity, and to have increased feelings of independence: 'may feel an individual, no longer "just one of the family."'[24]

Developmental stages post-childhood

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Adolescence

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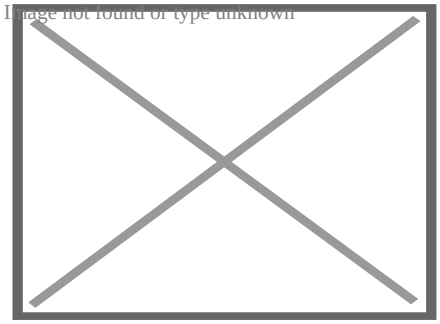

An adolescent girl, photographed by Paolo Monti

Adolescence is usually determined to be between the onset of puberty and legal adulthood: mostly corresponding to the teenage years (13–19). However, puberty usually begins before the teenage years (10—11 for girls and 11—12 for boys). Although biologically a child is a human being between the stages of birth and puberty,[1][2] adolescents are legally considered children, as they tend to lack adult rights and are still required to attend compulsory schooling in many cultures, though this varies. The onset of adolescence brings about various physical, psychological and behavioral changes. The end of adolescence and the beginning of adulthood varies by country and by function, and even within a single nation-state or culture there may be different ages at which an individual is considered to be mature enough to be entrusted by society with certain tasks.

History

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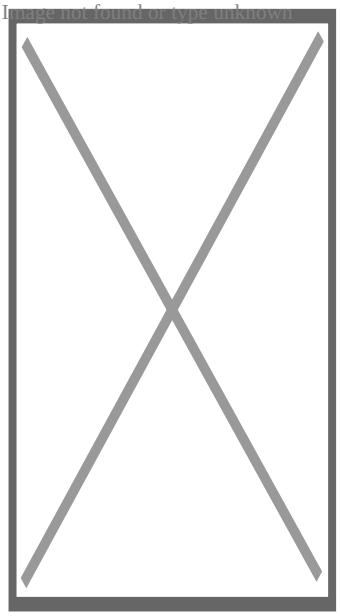
Main article: History of childhood



Playing Children, by Song dynasty Chinese artist Su Hanchen, c. 1150 AD.

During the European Renaissance, artistic depictions of children increased dramatically, which did not have much effect on the social attitude toward children, however.[25]

The French historian Philippe Ariès argued that during the 1600s, the concept of childhood began to emerge in Europe,[26] however other historians like Nicholas Orme have challenged this view and argued that childhood has been seen as a separate stage since at least the medieval period.[27] Adults saw children as separate beings, innocent and in need of protection and training by the adults around them. The English philosopher John Locke was particularly influential in defining this new attitude towards children, especially with regard to his theory of the tabula rasa, which considered the mind at birth to be a "blank slate". A corollary of this doctrine was that the mind of the child was born blank, and that it was the duty of the parents to imbue the child with correct notions. During the early period of capitalism, the rise of a large, commercial middle class, mainly in the Protestant countries of the Dutch Republic and England, brought about a new family ideology centred around the upbringing of children. Puritanism stressed the importance of individual salvation and concern for the spiritual welfare of children.[28]

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The Age of Innocence c. 1785/8. Reynolds emphasized the natural grace of children in his paintings.

The modern notion of childhood with its own autonomy and goals began to emerge during the 18th-century Enlightenment and the Romantic period that followed it.[29][30] Jean Jacques Rousseau formulated the romantic attitude towards children in his famous 1762 novel *Emile: or, On Education*. Building on the ideas of John Locke and other 17th-century thinkers, Jean-Jaques Rousseau described childhood as a brief period of sanctuary before people encounter the perils and hardships of adulthood.[29] Sir Joshua Reynolds' extensive children portraiture demonstrated the new enlightened attitudes toward young children. His 1788 painting *The Age of Innocence* emphasizes the innocence and natural grace of the posing child and soon became a public favourite.[31]

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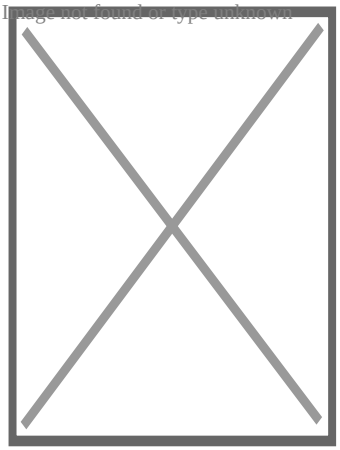
Brazilian princesses Leopoldina (left) and Isabel (center) with an unidentified friend, c. 1860.

The idea of childhood as a locus of divinity, purity, and innocence is further expounded upon in William Wordsworth's "Ode: Intimations of Immortality from Recollections of Early Childhood", the imagery of which he "fashioned from a complex mix of pastoral aesthetics, pantheistic views of divinity, and an idea of spiritual purity based on an Edenic notion of pastoral innocence infused with Neoplatonic notions of reincarnation".[30] This Romantic conception of childhood, historian Margaret Reeves suggests, has a longer history than generally recognized, with its roots traceable to similarly imaginative constructions of childhood circulating, for example, in the neo-platonic

poetry of seventeenth-century metaphysical poet Henry Vaughan (e.g., "The Retreate", 1650; "Childe-hood", 1655). Such views contrasted with the stridently didactic, Calvinist views of infant depravity.[32]



Armenian scouts in 1918

With the onset of industrialisation in England in 1760, the divergence between high-minded romantic ideals of childhood and the reality of the growing magnitude of child exploitation in the workplace, became increasingly apparent. By the late 18th century, British children were specially employed in factories and mines and as chimney sweeps,[33] often working long hours in dangerous jobs for low pay.[34] As the century wore on, the contradiction between the conditions on the ground for poor children and the middle-class notion of childhood as a time of simplicity and innocence led to the first campaigns for the imposition of legal protection for children.

British reformers attacked child labor from the 1830s onward, bolstered by the horrific descriptions of London street life by Charles Dickens.[35] The campaign eventually led to the Factory Acts, which mitigated the exploitation of children at the workplace[33][36]

Modern concepts of childhood

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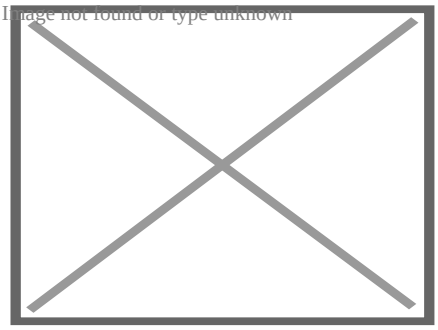

Children play in a fountain in a summer evening, Davis, California.

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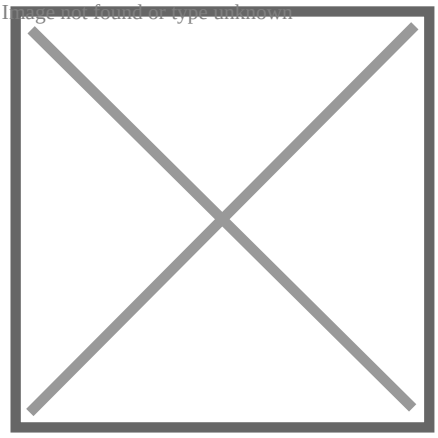

An old man and his granddaughter in Turkey.

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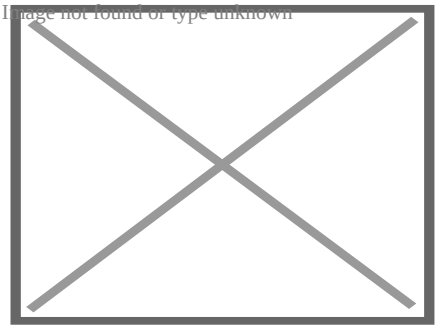

Nepalese children playing with cats.

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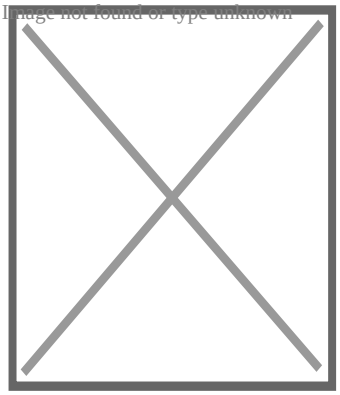


Harari girls in Ethiopia.

The modern attitude to children emerged by the late 19th century; the Victorian middle and upper classes emphasized the role of the family and the sanctity of the child – an attitude that has remained dominant in Western societies ever since.[37] The genre of children's literature took off, with a proliferation of humorous, child-oriented books attuned to the child's imagination. Lewis Carroll's fantasy *Alice's Adventures in Wonderland*, published in 1865 in England, was a landmark in the genre; regarded as the first "English masterpiece written for children", its publication opened the "First Golden Age" of children's literature.

The latter half of the 19th century saw the introduction of compulsory state schooling of children across Europe, which decisively removed children from the workplace into schools.[38][39]

The market economy of the 19th century enabled the concept of childhood as a time of fun, happiness, and imagination. Factory-made dolls and doll houses delighted the girls and organized sports and activities were played by the boys.[40] The Boy Scouts was founded by Sir Robert Baden-Powell in 1908,[41][42] which provided young boys with outdoor activities aiming at developing character, citizenship, and personal fitness qualities.[43]

In the 20th century, Philippe Ariès, a French historian specializing in medieval history, suggested that childhood was not a natural phenomenon, but a creation of society in his 1960 book *Centuries of Childhood*. In 1961 he published a study of paintings, gravestones, furniture, and school records, finding that before the 17th century, children were represented as mini-adults.

In 1966, the American philosopher George Boas published the book *The Cult of Childhood*. Since then, historians have increasingly researched childhood in past times.[44]

In 2006, Hugh Cunningham published the book *Invention of Childhood*, looking at British childhood from the year 1000, the Middle Ages, to what he refers to as the Post War Period of the 1950s, 1960s and 1970s.[45]

Childhood evolves and changes as lifestyles change and adult expectations alter. In the modern era, many adults believe that children should not have any worries or work, as life should be happy and trouble-free. Childhood is seen as a mixture of simplicity, innocence, happiness, fun, imagination, and wonder. It is thought of as a time of playing, learning, socializing, exploring, and worrying in a world without much adult interference.[29][30]

A "loss of innocence" is a common concept, and is often seen as an integral part of coming of age. It is usually thought of as an experience or period in a child's life that widens their awareness of evil, pain or the world around them. This theme is

demonstrated in the novels *To Kill a Mockingbird* and *Lord of the Flies*. The fictional character Peter Pan was the embodiment of a childhood that never ends.[46][47]

Healthy childhoods

[edit]

Role of parents

[edit]
Main article: Parenting

Children's health

[edit]
Further information: Childhood obesity, Childhood immunizations, and List of childhood diseases

Children's health includes the physical, mental and social well-being of children. Maintaining children's health implies offering them healthy foods, insuring they get enough sleep and exercise, and protecting their safety.[48] Children in certain parts of the world often suffer from malnutrition, which is often associated with other conditions, such diarrhea, pneumonia and malaria.[49]

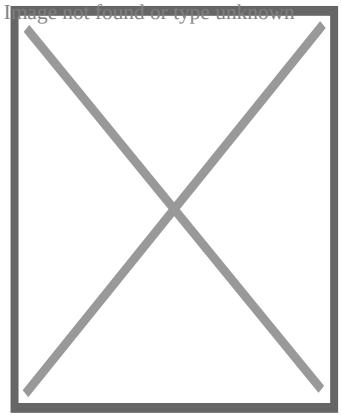
Child protection

[edit]
Further information: Child labor, Child labor laws, Risk aversion, Child abuse, and Protection of Children Act

Child protection, according to UNICEF, refers to "preventing and responding to violence, exploitation and abuse against children – including commercial sexual exploitation, trafficking, child labour and harmful traditional practices, such as female genital mutilation/cutting and child marriage".[50] The Convention on the Rights of the Child protects the fundamental rights of children.

Play

[edit]
Further information: Play (activity), Playground, Imaginary friend, and Childhood secret club



Dancing at Mother of Peace AIDs orphanage, Zimbabwe

Play is essential to the cognitive, physical, social, and emotional well-being of children.[51] It offers children opportunities for physical (running, jumping, climbing, etc.), intellectual (social skills, community norms, ethics and general knowledge) and emotional development (empathy, compassion, and friendships). Unstructured play encourages creativity and imagination. Playing and interacting with other children, as well as some adults, provides opportunities for friendships, social interactions, conflicts and resolutions. However, adults tend to (often mistakenly) assume that virtually all children's social activities can be understood as "play" and, furthermore, that children's play activities do not involve much skill or effort.[52][53][54][55]

It is through play that children at a very early age engage and interact in the world around them. Play allows children to create and explore a world they can master, conquering their fears while practicing adult roles, sometimes in conjunction with other children or adult caregivers.[51] Undirected play allows children to learn how to work in groups, to share, to negotiate, to resolve conflicts, and to learn self-advocacy skills. However, when play is controlled by adults, children acquiesce to adult rules and concerns and lose some of the benefits play offers them. This is especially true in developing creativity, leadership, and group skills.[51]

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Ralph Hedley, *The Tournament,* 1898. It depicts poorer boys playing outdoors in a rural part of the Northeast of England.

Play is considered to be very important to optimal child development that it has been recognized by the United Nations Commission on Human Rights as a right of every child.[11] Children who are being raised in a hurried and pressured style may limit the protective benefits they would gain from child-driven play.[51]

The initiation of play in a classroom setting allows teachers and students to interact through playfulness associated with a learning experience. Therefore, playfulness aids the interactions between adults and children in a learning environment. “Playful Structure” means to combine informal learning with formal learning to produce an effective learning experience for children at a young age.[56]

Even though play is considered to be the most important to optimal child development, the environment affects their play and therefore their development. Poor children confront widespread environmental inequities as they experience less social support, and their parents are less responsive and more authoritarian. Children from low income families are less likely to have access to books and computers which would enhance their development.[57]

Street culture

[edit]
Main articles: Children's street culture and Children's street games

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Children in front of a movie theatre, Toronto, 1920s.

Children's street culture refers to the cumulative culture created by young children and is sometimes referred to as their *secret world*. It is most common in children between the ages of seven and twelve. It is strongest in urban working class industrial districts where children are traditionally free to play out in the streets for long periods without supervision. It is invented and largely sustained by children themselves with little adult interference.

Young children's street culture usually takes place on quiet backstreets and pavements, and along routes that venture out into local parks, playgrounds, scrub and wasteland, and to local shops. It often imposes imaginative status on certain sections of the urban realm (local buildings, kerbs, street objects, etc.). Children designate specific areas that serve as informal meeting and relaxation places (see: Sobel, 2001). An urban area that looks faceless or neglected to an adult may have deep 'spirit of place' meanings in to children. Since the advent of indoor distractions such as video games, and television, concerns have been expressed about the vitality – or even the survival – of children's street culture.

Geographies of childhood

[edit]

The geographies of childhood involves how (adult) society perceives the idea of childhood, the many ways adult attitudes and behaviors affect children's lives, including the environment which surrounds children and its implications.[58]

The geographies of childhood is similar in some respects to children's geographies which examines the places and spaces in which children live.[59]

Nature deficit disorder

[edit]
Main article: Nature deficit disorder

Nature Deficit Disorder, a term coined by Richard Louv in his 2005 book *Last Child in the Woods,* refers to the trend in the United States and Canada towards less time for outdoor play,[60][61] resulting in a wide range of behavioral problems.[62]

With increasing use of cellphones, computers, video games and television, children have more reasons to stay inside rather than outdoors exploring. “The average

American child spends 44 hours a week with electronic media".[63] Research in 2007 has drawn a correlation between the declining number of National Park visits in the U.S. and increasing consumption of electronic media by children.[64] The media has accelerated the trend for children's nature disconnection by deemphasizing views of nature, as in Disney films.[65]

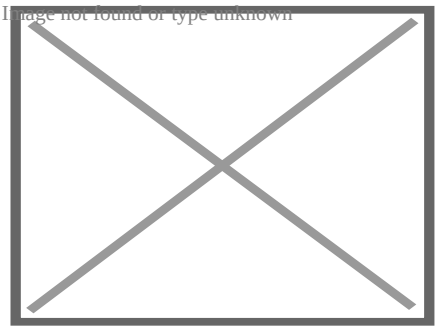
Age of responsibility

[edit]
Further information: Age of consent, Age of majority, Age of criminal responsibility, and Marriageable age

The age at which children are considered responsible for their society-bound actions (e. g. marriage, voting, etc.) has also changed over time,[66] and this is reflected in the way they are treated in courts of law. In Roman times, children were regarded as not culpable for crimes, a position later adopted by the Church. In the 19th century, children younger than seven years old were believed incapable of crime. Children from the age of seven forward were considered responsible for their actions. Therefore, they could face criminal charges, be sent to adult prison, and be punished like adults by whipping, branding or hanging. However, courts at the time would consider the offender's age when deliberating sentencing.[*citation needed*] Minimum employment age and marriage age also vary. The age limit of voluntary/involuntary military service is also disputed at the international level.[67]

Education

[edit]



Children in an outdoor classroom in Bié, Angola

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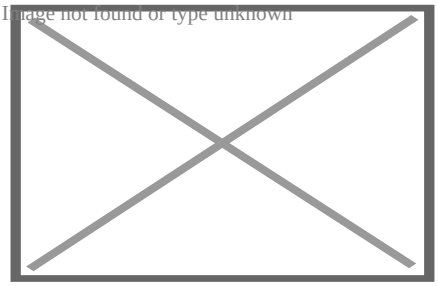

Children seated in a Finnish classroom at the school of Torvinen in Sodankylä, Finland, in the 1920s

Main article: Education

Education, in the general sense, refers to the act or process of imparting or acquiring general knowledge, developing the powers of reasoning and judgment, and preparing intellectually for mature life.[68] Formal education most often takes place through schooling. A right to education has been recognized by some governments. At the global level, Article 13 of the United Nations' 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR) recognizes the right of everyone to an education.[69] Education is compulsory in most places up to a certain age, but attendance at school may not be, with alternative options such as home-schooling or e-learning being recognized as valid forms of education in certain jurisdictions.

Children in some countries (especially in parts of Africa and Asia) are often kept out of school, or attend only for short periods. Data from UNICEF indicate that in 2011, 57 million children were out of school; and more than 20% of African children have never attended primary school or have left without completing primary education.[70] According to a UN report, warfare is preventing 28 million children worldwide from receiving an education, due to the risk of sexual violence and attacks in schools.[71] Other factors that keep children out of school include poverty, child labor, social attitudes, and long distances to school.[72][73]

Attitudes toward children

[edit]

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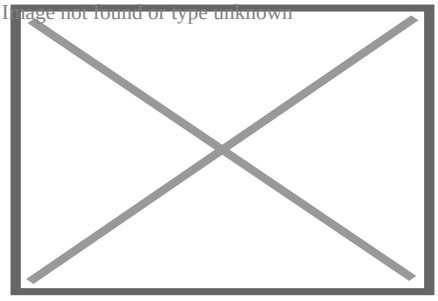

Group of breaker boys in Pittston, Pennsylvania, 1911. Child labor was widespread until the early 20th century. In the 21st century, child labor rates are highest in Africa.

Social attitudes toward children differ around the world in various cultures and change over time. A 1988 study on European attitudes toward the centrality of children found that Italy was more child-centric and the Netherlands less child-centric, with other countries, such as Austria, Great Britain, Ireland and West Germany falling in between.[74]

Child marriage

[edit]

In 2013, child marriage rates of female children under the age of 18 reached 75% in Niger, 68% in Central African Republic and Chad, 66% in Bangladesh, and 47% in India.[75] According to a 2019 UNICEF report on child marriage, 37% of females were married before the age of 18 in sub-Saharan Africa, followed by South Asia at 30%. Lower levels were found in Latin America and Caribbean (25%), the Middle East and North Africa (18%), and Eastern Europe and Central Asia (11%), while rates in Western Europe and North America were minimal.[76] Child marriage is more prevalent with girls, but also involves boys. A 2018 study in the journal Vulnerable Children and Youth Studies found that, worldwide, 4.5% of males are married before age 18, with the Central African Republic having the highest average rate at 27.9%.[77]

Fertility and number of children per woman

[edit]

Before contraception became widely available in the 20th century, women had little choice other than abstinence or having often many children. In fact, current population growth concerns have only become possible with drastically reduced child mortality and sustained fertility. In 2017 the global total fertility rate was estimated to be 2.37 children per woman,[78] adding about 80 million people to the world population per year. In order to measure the total number of children, scientists often prefer the completed cohort fertility at age 50 years (CCF50).[78] Although the number of children is also influenced by cultural norms, religion, peer pressure and other social

factors, the CCF50 appears to be most heavily dependent on the educational level of women, ranging from 5–8 children in women without education to less than 2 in women with 12 or more years of education.[78]

Issues

[edit]

Emergencies and conflicts

[edit]
See also: Declaration on the Protection of Women and Children in Emergency and Armed Conflict, Children in the Israeli–Palestinian conflict, Save the Children, Inter-Agency Network for Education in Emergencies, Military use of children, Trafficking of children, International child abduction, and Refugee children

Emergencies and conflicts pose detrimental risks to the health, safety, and well-being of children. There are many different kinds of conflicts and emergencies, e.g. wars and natural disasters. As of 2010 approximately 13 million children are displaced by armed conflicts and violence around the world.[79] Where violent conflicts are the norm, the lives of young children are significantly disrupted and their families have great difficulty in offering the sensitive and consistent care that young children need for their healthy development.[79] Studies on the effect of emergencies and conflict on the physical and mental health of children between birth and 8 years old show that where the disaster is natural, the rate of PTSD occurs in anywhere from 3 to 87 percent of affected children.[80] However, rates of PTSD for children living in chronic conflict conditions varies from 15 to 50 percent.[81][82]

Child protection

[edit]
This section is an excerpt from Child protection.[edit]

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Childcare
At home

- Parents
- Extended family
- Au pair
- Babysitter
- Governess
- Nanny

Outside the home

- Daycare
- Pre-school playgroup

Educational settings

- Early childhood education
- Homeschooling
- Pre-kindergarten
- Preschool
- Kindergarten
- Primary school

Institutions and standards

- Child protection
- *In loco parentis*
- Minor

Related

- Child abuse
- Child marriage
- Child Online Protection
- Family law
- Men in early childhood education
- Orphanage
- Parenting

Child protection (also called child welfare) is the safeguarding of children from violence, exploitation, abuse, abandonment, and neglect.[83][84][85][86] It involves identifying signs of potential harm. This includes responding to allegations or suspicions of abuse, providing support and services to protect children, and holding those who have harmed them accountable.[87]

The primary goal of child protection is to ensure that all children are safe and free from harm or danger.[86][88] Child protection also works to prevent future harm by creating policies and systems that identify and respond to risks before they lead to harm.[89]

In order to achieve these goals, research suggests that child protection services should be provided in a holistic way.[90][91][92] This means taking into account the social, economic, cultural, psychological, and environmental factors that can contribute to the risk of harm for individual children and their families. Collaboration across sectors and disciplines to create a comprehensive system of support and safety for children is required.[93][94]

It is the responsibility of individuals, organizations, and governments to ensure that children are protected from harm and their rights are respected.[95] This includes providing a safe environment for children to grow and develop, protecting them from physical, emotional and sexual abuse, and ensuring they have access to education, healthcare, and resources to fulfill their basic needs.[96]

Child protection systems are a set of services, usually government-run, designed to protect children and young people who are underage and to encourage family stability. UNICEF defines[97] a 'child protection system' as:

> "The set of laws, policies, regulations and services needed across all social sectors – especially social welfare, education, health, security and justice – to support prevention and response to protection-related risks. These systems are part of social protection, and extend beyond it. At the level of prevention, their aim includes supporting and strengthening families to reduce social exclusion, and to lower the risk of separation, violence and exploitation. Responsibilities are often spread across government agencies, with services delivered by local authorities, non-State providers, and community groups, making coordination between sectors and levels, including routine referral systems etc.., a necessary component of effective child protection systems."
>
> —Ã¢â‚¬Å *United Nations Economic and Social Council (2008), UNICEF Child Protection Strategy, E/ICEF/2008/5/Rev.1, par. 12–13.*

Under Article 19 of the UN Convention on the Rights of the Child, a 'child protection system' provides for the protection of children in and out of the home. One of the ways this can be enabled is through the provision of quality education, the fourth of the United Nations Sustainable Development Goals, in addition to other child protection systems. Some literature argues that child protection begins at conception; even how the conception took place can affect the child's development.[98]

Child abuse and child labor

[edit]

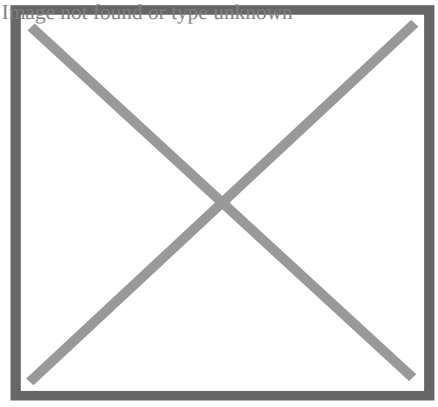
Protection of children from abuse is considered an important contemporary goal. This includes protecting children from exploitation such as child labor, child trafficking and child selling, child sexual abuse, including child prostitution and child pornography, military use of children, and child laundering in illegal adoptions. There exist several international instruments for these purposes, such as:

- Worst Forms of Child Labour Convention
- Minimum Age Convention, 1973
- Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography
- Council of Europe Convention on the Protection of Children against Sexual Exploitation and Sexual Abuse
- Optional Protocol on the Involvement of Children in Armed Conflict
- Hague Adoption Convention

Climate change

[edit]

This section is an excerpt from Climate change and children.[edit]



A child at a climate demonstration in Juneau, Alaska

Children are more vulnerable to the effects of climate change than adults. The World Health Organization estimated that 88% of the existing global burden of disease

caused by climate change affects children under five years of age.[99] A *Lancet* review on health and climate change lists children as the worst-affected category by climate change.[100] Children under 14 are 44 percent more likely to die from environmental factors,[101] and those in urban areas are disproportionately impacted by lower air quality and overcrowding.[102]

Children are physically more vulnerable to climate change in all its forms.[103] Climate change affects the physical health of children and their well-being. Prevailing inequalities, between and within countries, determine how climate change impacts children.[104] Children often have no voice in terms of global responses to climate change.[103]

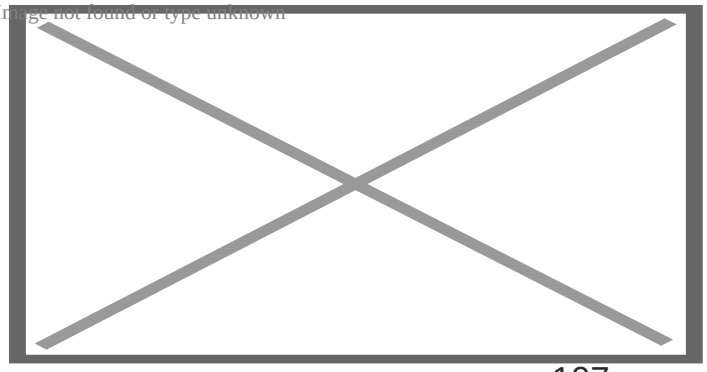
People living in low-income countries experience a higher burden of disease and are less capable of coping with climate change-related threats.[105] Nearly every child in the world is at risk from climate change and pollution, while almost half are at extreme risk.[106]

Health

[edit]

Child mortality

[edit]
Main articles: Child mortality and Infant mortality



World infant mortality rates in 2012.[107]

During the early 17th century in England, about two-thirds of all children died before the age of four.[108] During the Industrial Revolution, the life expectancy of children increased dramatically.[109] This has continued in England, and in the 21st century child mortality rates have fallen across the world. About 12.6 million under-five infants died worldwide in 1990, which declined to 6.6 million in 2012. The infant mortality rate

dropped from 90 deaths per 1,000 live births in 1990, to 48 in 2012. The highest average infant mortality rates are in sub-Saharan Africa, at 98 deaths per 1,000 live births – over double the world's average.[107]

See also

[edit]
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(Audio help · More spoken articles)

- Outline of childhood
- Child slavery
- Childlessness
- Depression in childhood and adolescence
- One-child policy
- Religion and children
- Youth rights
- Archaeology of childhood

Sources

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Preceded by **Toddlerhood** | **Stages of human development** | Succeeded by **Childhood** | **Preadolescence**

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Family

- History
- Household
- Nuclear family
- Extended family
- Conjugal family
- Immediate family
- Matrifocal family

First-degree relatives	○ Parent
	  ○ mother
	  ○ father
	○ Child
	  ○ son
	  ○ daughter
	○ Sibling
	  ○ brother
	  ○ sister

Second-degree relatives	○ Grandparent ○ Grandchild ○ Uncle/Aunt ○ Niece and nephew
Third-degree relatives	○ Great-grandparent ○ Great-grandchild ○ Great-uncle/Great-aunt ○ Cousin

Family-in-law	○ Spouse
	  ○ wife
	  ○ husband
	○ Parent-in-law
	○ Sibling-in-law
	○ Child-in-law
	  ○ daughter-in-law
	  ○ son-in-law

Stepfamily	○ Stepparent
	  ○ stepfather
	  ○ stepmother
	○ Stepchild
	○ Stepsibling

Kinship terminology

- Kinship
- Australian Aboriginal kinship
- Adoption
- Affinity
- Consanguinity
- Disownment
- Divorce
- Estrangement
- Family of choice
- Fictive kinship
- Marriage
- Nurture kinship
- Chinese kinship
- Hawaiian kinship
- Sudanese kinship
- Eskimo kinship
- Iroquois kinship
- Crow kinship
- Omaha kinship

Genealogy and lineage

- Bilateral descent
- Common ancestor
- Family name
- Heirloom
- Heredity
- Inheritance
- Lineal descendant
- collateral descent
- Matrilineality
- Patrilineality
- Progenitor
- Clan
- Royal descent

Family trees

- Pedigree chart
- Genogram
- Ahnentafel
  - Genealogical numbering systems
  - Seize quartiers
  - Quarters of nobility

Relationships	○ Agape (parental love) ○ Eros (marital love) ○ Philia (brotherly love) ○ Storge (familial love) ○ Filial piety ○ Polyfidelity
Holidays	○ Mother's Day ○ U.S. ○ Father's Day ○ Father–Daughter Day ○ Siblings Day ○ National Grandparents Day ○ Parents' Day ○ Children's Day ○ Japan ○ Family Day ○ Canada ○ American Family Day ○ International Day of Families ○ National Family Week ○ UK ○ National Adoption Day
Related	○ Single parent ○ Wedding anniversary ○ Godparent ○ Birth order ○ Only child ○ Middle child syndrome ○ Sociology of the family ○ Museum of Motherhood ○ Astronaut family ○ Dysfunctional family ○ Domestic violence ○ Incest ○ Sibling abuse ○ Sibling estrangement ○ Sibling rivalry

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Development of the human body

Before birth

- Development
- Zygote
- Embryo
- Fetus
- Gestational age
- Birth
- Child development
  - Stages
  - Early
  - Puberty

Birth and after

- Adult development
- Ageing
- Senescence
- Death
- Early years
  - Infant
  - Toddler
  - Early childhood
  - Childhood
    - Child
- Youth

Phases

  - Preadolescence
  - Adolescence
  - Emerging adulthood
- Adulthood
  - Young adult
  - Middle adult
  - Elder adult
- Dying

Social and legal

- Minor
- Age of majority

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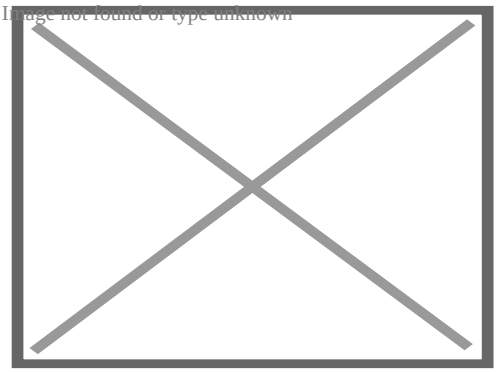
Other	○ NARA ○ Encyclopedia of Modern Ukraine

About orthodontics

Orthodontics



Connecting the arch-wire on brackets with wire

Occupation	
Names	Orthodontist
Occupation type	Specialty
Activity sectors	Dentistry
Description	
Education required	Dental degree, specialty training
Fields of employment	Private practices, hospitals

Orthodontics[a][b] is a dentistry specialty that addresses the diagnosis, prevention, management, and correction of mal-positioned teeth and jaws, as well as misaligned bite patterns.[2] It may also address the modification of facial growth, known as **dentofacial orthopedics**.

Abnormal alignment of the teeth and jaws is very common. The approximate worldwide prevalence of malocclusion was as high as 56%.[3] However, conclusive scientific evidence for the health benefits of orthodontic treatment is lacking, although patients with completed treatment have reported a higher quality of life than that of untreated patients undergoing orthodontic treatment.[4][5] The main reason for the prevalence of these malocclusions is diets with less fresh fruit and vegetables and overall softer foods in childhood, causing smaller jaws with less room for the teeth to erupt.[6] Treatment may require several months to a few years and entails using dental braces

and other appliances to gradually adjust tooth position and jaw alignment. In cases where the malocclusion is severe, jaw surgery may be incorporated into the treatment plan. Treatment usually begins before a person reaches adulthood, insofar as pre-adult bones may be adjusted more easily before adulthood.

History

[edit]

Though it was rare until the Industrial Revolution,[7] there is evidence of the issue of overcrowded, irregular, and protruding teeth afflicting individuals. Evidence from Greek and Etruscan materials suggests that attempts to treat this disorder date back to 1000 BC, showcasing primitive yet impressively well-crafted orthodontic appliances. In the 18th and 19th centuries, a range of devices for the "regulation" of teeth were described by various dentistry authors who occasionally put them into practice.[8] As a modern science, orthodontics dates back to the mid-1800s.[9] The field's influential contributors include Norman William Kingsley[9] (1829–1913) and Edward Angle[10] (1855–1930). Angle created the first basic system for classifying malocclusions, a system that remains in use today.[9]

Beginning in the mid-1800s, Norman Kingsley published *Oral Deformities*, which is now credited as one of the first works to begin systematically documenting orthodontics. Being a major presence in American dentistry during the latter half of the 19th century, not only was Kingsley one of the early users of extraoral force to correct protruding teeth, but he was also one of the pioneers for treating cleft palates and associated issues. During the era of orthodontics under Kingsley and his colleagues, the treatment was focused on straightening teeth and creating facial harmony. Ignoring occlusal relationships, it was typical to remove teeth for a variety of dental issues, such as malalignment or overcrowding. The concept of an intact dentition was not widely appreciated in those days, making bite correlations seem irrelevant.[8]

In the late 1800s, the concept of occlusion was essential for creating reliable prosthetic replacement teeth. This idea was further refined and ultimately applied in various ways when dealing with healthy dental structures as well. As these concepts of prosthetic occlusion progressed, it became an invaluable tool for dentistry.[8]

It was in 1890 that the work and impact of Dr. Edwards H. Angle began to be felt, with his contribution to modern orthodontics particularly noteworthy. Initially focused on prosthodontics, he taught in Pennsylvania and Minnesota before directing his attention towards dental occlusion and the treatments needed to maintain it as a normal condition, thus becoming known as the "father of modern orthodontics".[8]

By the beginning of the 20th century, orthodontics had become more than just the straightening of crooked teeth. The concept of ideal occlusion, as postulated by Angle and incorporated into a classification system, enabled a shift towards treating malocclusion, which is any deviation from normal occlusion.[8] Having a full set of teeth on both arches was highly sought after in orthodontic treatment due to the need for exact relationships between them. Extraction as an orthodontic procedure was heavily opposed by Angle and those who followed him. As occlusion became the key priority, facial proportions and aesthetics were neglected. To achieve ideal occlusals without using external forces, Angle postulated that having perfect occlusion was the best way to gain optimum facial aesthetics.[8]

With the passing of time, it became quite evident that even an exceptional occlusion was not suitable when considered from an aesthetic point of view. Not only were there issues related to aesthetics, but it usually proved impossible to keep a precise occlusal relationship achieved by forcing teeth together over extended durations with the use of robust elastics, something Angle and his students had previously suggested. Charles Tweed[11] in America and Raymond Begg[12] in Australia (who both studied under Angle) re-introduced dentistry extraction into orthodontics during the 1940s and 1950s so they could improve facial esthetics while also ensuring better stability concerning occlusal relationships.[13]

In the postwar period, cephalometric radiography[14] started to be used by orthodontists for measuring changes in tooth and jaw position caused by growth and treatment.[15] The x-rays showed that many Class II and III malocclusions were due to improper jaw relations as opposed to misaligned teeth. It became evident that orthodontic therapy could adjust mandibular development, leading to the formation of functional jaw orthopedics in Europe and extraoral force measures in the US. These days, both functional appliances and extraoral devices are applied around the globe with the aim of amending growth patterns and forms. Consequently, pursuing true, or at least improved, jaw relationships had become the main objective of treatment by the mid-20th century.[8]

At the beginning of the twentieth century, orthodontics was in need of an upgrade. The American Journal of Orthodontics was created for this purpose in 1915; before it, there were no scientific objectives to follow, nor any precise classification system and brackets that lacked features.[16]

Until the mid-1970s, braces were made by wrapping metal around each tooth.[9] With advancements in adhesives, it became possible to instead bond metal brackets to the teeth.[9]

In 1972, Lawrence F. Andrews gave an insightful definition of the ideal occlusion in permanent teeth. This has had meaningful effects on orthodontic treatments that are

administered regularly,[16] and these are: 1. Correct interarchal relationships 2. Correct crown angulation (tip) 3. Correct crown inclination (torque) 4. No rotations 5. Tight contact points 6. Flat Curve of Spee (0.0–2.5 mm),[17] and based on these principles, he discovered a treatment system called the straight-wire appliance system, or the pre-adjusted edgewise system. Introduced in 1976, Larry Andrews' pre-adjusted edgewise appliance, more commonly known as the straight wire appliance, has since revolutionized fixed orthodontic treatment. The advantage of the design lies in its bracket and archwire combination, which requires only minimal wire bending from the orthodontist or clinician. It's aptly named after this feature: the angle of the slot and thickness of the bracket base ultimately determine where each tooth is situated with little need for extra manipulation.[18][19][20]

Prior to the invention of a straight wire appliance, orthodontists were utilizing a non-programmed standard edgewise fixed appliance system, or Begg's pin and tube system. Both of these systems employed identical brackets for each tooth and necessitated the bending of an archwire in three planes for locating teeth in their desired positions, with these bends dictating ultimate placements.[18]

Evolution of the current orthodontic appliances

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When it comes to orthodontic appliances, they are divided into two types: removable and fixed. Removable appliances can be taken on and off by the patient as required. On the other hand, fixed appliances cannot be taken off as they remain bonded to the teeth during treatment.

Fixed appliances

[edit]

Fixed orthodontic appliances are predominantly derived from the edgewise appliance approach, which typically begins with round wires before transitioning to rectangular archwires for improving tooth alignment. These rectangluar wires promote precision in the positioning of teeth following initial treatment. In contrast to the Begg appliance, which was based solely on round wires and auxiliary springs, the Tip-Edge system emerged in the early 21st century. This innovative technology allowed for the utilization of rectangular archwires to precisely control tooth movement during the finishing stages after initial treatment with round wires. Thus, almost all modern fixed appliances can be considered variations on this edgewise appliance system.

Early 20th-century orthodontist Edward Angle made a major contribution to the world of dentistry. He created four distinct appliance systems that have been used as the basis for many orthodontic treatments today, barring a few exceptions. They are E-arch, pin and tube, ribbon arch, and edgewise systems.

E-arch

[edit]

Edward H. Angle made a significant contribution to the dental field when he released the 7th edition of his book in 1907, which outlined his theories and detailed his technique. This approach was founded upon the iconic "E-Arch" or 'the-arch' shape as well as inter-maxillary elastics.[21] This device was different from any other appliance of its period as it featured a rigid framework to which teeth could be tied effectively in order to recreate an arch form that followed pre-defined dimensions.[22] Molars were fitted with braces, and a powerful labial archwire was positioned around the arch. The wire ended in a thread, and to move it forward, an adjustable nut was used, which allowed for an increase in circumference. By ligation, each individual tooth was attached to this expansive archwire.[8]

Pin and tube appliance

[edit]

Due to its limited range of motion, Angle was unable to achieve precise tooth positioning with an E-arch. In order to bypass this issue, he started using bands on other teeth combined with a vertical tube for each individual tooth. These tubes held a soldered pin, which could be repositioned at each appointment in order to move them in place.[8] Dubbed the "bone-growing appliance", this contraption was theorized to encourage healthier bone growth due to its potential for transferring force directly to the roots.[23] However, implementing it proved troublesome in reality.

Ribbon arch

[edit]

Realizing that the pin and tube appliance was not easy to control, Angle developed a better option, the ribbon arch, which was much simpler to use. Most of its components were already prepared by the manufacturer, so it was significantly easier to manage than before. In order to attach the ribbon arch, the occlusal area of the bracket was

opened. Brackets were only added to eight incisors and mandibular canines, as it would be impossible to insert the arch into both horizontal molar tubes and the vertical brackets of adjacent premolars. This lack of understanding posed a considerable challenge to dental professionals; they were unable to make corrections to an excessive Spee curve in bicuspid teeth.[24] Despite the complexity of the situation, it was necessary for practitioners to find a resolution. Unparalleled to its counterparts, what made the ribbon arch instantly popular was that its archwire had remarkable spring qualities and could be utilized to accurately align teeth that were misaligned. However, a major drawback of this device was its inability to effectively control root position since it did not have enough resilience to generate the torque movements required for setting roots in their new place.[8]

Edgewise appliance

[edit]

In an effort to rectify the issues with the ribbon arch, Angle shifted the orientation of its slot from vertical, instead making it horizontal. In addition, he swapped out the wire and replaced it with a precious metal wire that was rotated by 90 degrees in relation—henceforth known as Edgewise.[25] Following extensive trials, it was concluded that dimensions of 22 × 28 mils were optimal for obtaining excellent control over crown and root positioning across all three planes of space.[26] After debuting in 1928, this appliance quickly became one of the mainstays for multibanded fixed therapy, although ribbon arches continued to be utilized for another decade or so beyond this point too.[8]

Labiolingual

[edit]

Prior to Angle, the idea of fitting attachments on individual teeth had not been thought of, and in his lifetime, his concern for precisely positioning each tooth was not highly appraised. In addition to using fingersprings for repositioning teeth with a range of removable devices, two main appliance systems were very popular in the early part of the 20th century. Labiolingual appliances use bands on the first molars joined with heavy lingual and labial archwires affixed with soldered fingersprings to shift single teeth.

Twin wire

[edit]

Utilizing bands around both incisors and molars, a twin-wire appliance was designed to provide alignment between these teeth. Constructed with two 10-mil steel archwires, its delicate features were safeguarded by lengthy tubes stretching from molars towards canines. Despite its efforts, it had limited capacity for movement without further modifications, rendering it obsolete in modern orthodontic practice.

Begg's Appliance

[edit]

Returning to Australia in the 1920s, the renowned orthodontist, Raymond Begg, applied his knowledge of ribbon arch appliances, which he had learned from the Angle School. On top of this, Begg recognized that extracting teeth was sometimes vital for successful outcomes and sought to modify the ribbon arch appliance to provide more control when dealing with root positioning. In the late 1930s, Begg developed his adaptation of the appliance, which took three forms. Firstly, a high-strength 16-mil round stainless steel wire replaced the original precious metal ribbon arch. Secondly, he kept the same ribbon arch bracket but inverted it so that it pointed toward the gums instead of away from them. Lastly, auxiliary springs were added to control root movement. This resulted in what would come to be known as the Begg Appliance. With this design, friction was decreased since contact between wire and bracket was minimal, and binding was minimized due to tipping and uprighting being used for anchorage control, which lessened contact angles between wires and corners of the bracket.

Tip-Edge System

[edit]

Begg's influence is still seen in modern appliances, such as Tip-Edge brackets. This type of bracket incorporates a rectangular slot cutaway on one side to allow for crown tipping with no incisal deflection of an archwire, allowing teeth to be tipped during space closure and then uprighted through auxiliary springs or even a rectangular wire for torque purposes in finishing. At the initial stages of treatment, small-diameter steel archwires should be used when working with Tip-Edge brackets.

Contemporary edgewise systems

[edit]

Throughout time, there has been a shift in which appliances are favored by dentists. In particular, during the 1960s, when it was introduced, the Begg appliance gained wide popularity due to its efficiency compared to edgewise appliances of that era; it could produce the same results with less investment on the dentist's part. Nevertheless, since then, there have been advances in technology and sophistication in edgewise appliances, which led to the opposite conclusion: nowadays, edgewise appliances are more efficient than the Begg appliance, thus explaining why it is commonly used.

Automatic rotational control

[edit]

At the beginning, Angle attached eyelets to the edges of archwires so that they could be held with ligatures and help manage rotations. Now, however, no extra ligature is needed due to either twin brackets or single brackets that have added wings touching underneath the wire (Lewis or Lang brackets). Both types of brackets simplify the process of obtaining moments that control movements along a particular plane of space.

Alteration in bracket slot dimensions

[edit]

In modern dentistry, two types of edgewise appliances exist: the 18- and 22-slot varieties. While these appliances are used differently, the introduction of a 20-slot device with more precise features has been considered but not pursued yet.[27]

Straight-wire bracket prescriptions

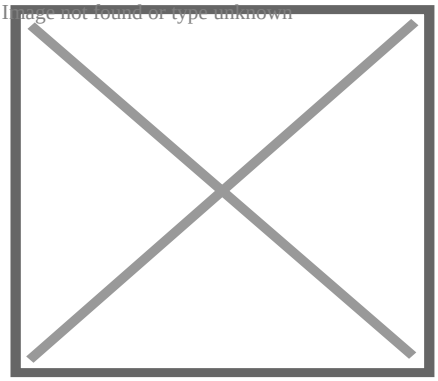
[edit]

Rather than rely on the same bracket for all teeth, L.F. Andrews found a way to make different brackets for each tooth in the 1980s, thanks to the increased convenience of bonding.[28] This adjustment enabled him to avoid having multiple bends in archwires that would have been needed to make up for variations in tooth anatomy. Ultimately, this led to what was termed a "straight-wire appliance" system – an edgewise appliance that greatly enhanced its efficiency.[29] The modern edgewise appliance has slightly different construction than the original one. Instead of relying on faciolingual bends to accommodate variations among teeth, each bracket has a correspondingly varying base thickness depending on the tooth it is intended for. However, due to individual differences between teeth, this does not completely eliminate the need for compensating bends.[30] Accurately placing the roots of many teeth requires angling brackets in relation to the long axis of the tooth. Traditionally, this mesiodistal root positioning necessitated using second-order, or tip, bends along the archwire. However, angling the bracket or bracket slot eliminates this need for bends.

Given the discrepancies in inclination of facial surfaces across individual teeth, placing a twist, otherwise known as third-order or torque bends, into segments of each rectangular archwire was initially required with the edgewise appliance. These bends were necessary for all patients and wires, not just to avoid any unintentional movement of suitably placed teeth or when moving roots facially or lingually. Angulation of either brackets or slots can minimize the need for second-order or tip bends on archwires. Contemporary edgewise appliances come with brackets designed to adjust for any facial inclinations, thereby eliminating or reducing any third-order bends. These brackets already have angulation and torque values built in so that each rectangluar archwire can be contorted to form a custom fit without inadvertently shifting any correctly positioned teeth. Without bracket angulation and torque, second-order or tip bends would still be required on each patient's archwire.

Methods

[edit]



Upper and lower jaw functional expanders

A typical treatment for incorrectly positioned teeth (malocclusion) takes from one to two years, with braces being adjusted every four to 10 weeks by orthodontists,[31] while university-trained dental specialists are versed in the prevention, diagnosis, and treatment of dental and facial irregularities. Orthodontists offer a wide range of treatment options to straighten crooked teeth, fix irregular bites, and align the jaws correctly.[32] There are many ways to adjust malocclusion. In growing patients, there are more options to treat skeletal discrepancies, either by promoting or restricting growth using functional appliances, orthodontic headgear, or a reverse pull facemask. Most orthodontic work begins in the early permanent dentition stage before skeletal growth is completed. If skeletal growth has completed, jaw surgery is an option. Sometimes teeth are extracted to aid the orthodontic treatment (teeth are extracted in about half of all the cases, most commonly the premolars).[33]

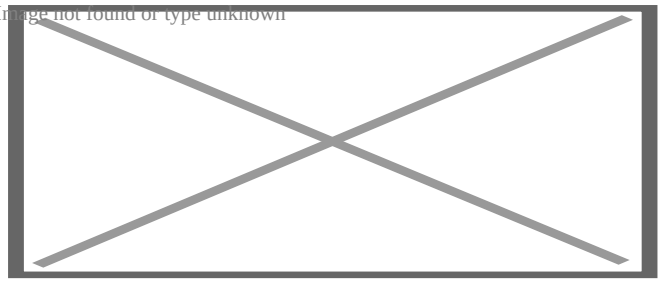
Orthodontic therapy may include the use of fixed or removable appliances. Most orthodontic therapy is delivered using appliances that are fixed in place,[34] for example, braces that are adhesively bonded to the teeth. Fixed appliances may provide greater mechanical control of the teeth; optimal treatment outcomes are improved by using fixed appliances.

Fixed appliances may be used, for example, to rotate teeth if they do not fit the arch shape of the other teeth in the mouth, to adjust multiple teeth to different places, to change the tooth angle of teeth, or to change the position of a tooth's root. This treatment course is not preferred where a patient has poor oral hygiene, as decalcification, tooth decay, or other complications may result. If a patient is unmotivated (insofar as treatment takes several months and requires commitment to oral hygiene), or if malocclusions are mild.

The biology of tooth movement and how advances in gene therapy and molecular biology technology may shape the future of orthodontic treatment.[35]

Braces

[edit]



Dental braces

Braces are usually placed on the front side of the teeth, but they may also be placed on the side facing the tongue (called lingual braces). Brackets made out of stainless steel or porcelain are bonded to the center of the teeth using an adhesive. Wires are placed in a slot in the brackets, which allows for controlled movement in all three dimensions.

Apart from wires, forces can be applied using elastic bands,[36] and springs may be used to push teeth apart or to close a gap. Several teeth may be tied together with ligatures, and different kinds of hooks can be placed to allow for connecting an elastic band.[37][36]

Clear aligners are an alternative to braces, but insufficient evidence exists to determine their effectiveness.[38]

Treatment duration

[edit]

The time required for braces varies from person to person as it depends on the severity of the problem, the amount of room available, the distance the teeth must travel, the health of the teeth, gums, and supporting bone, and how closely the patient follows instructions. On average, however, once the braces are put on, they usually remain in place for one to three years. After braces are removed, most patients will need to wear a retainer all the time for the first six months, then only during sleep for many years.[39]

Headgear

[edit]

Orthodontic headgear, sometimes referred to as an "extra-oral appliance", is a treatment approach that requires the patient to have a device strapped onto their head to help correct malocclusion—typically used when the teeth do not align properly. Headgear is most often used along with braces or other orthodontic appliances. While braces correct the position of teeth, orthodontic headgear—which, as the name suggests, is worn on or strapped onto the patient's head—is most often added to orthodontic treatment to help alter the alignment of the jaw, although there are some situations in which such an appliance can help move teeth, particularly molars.

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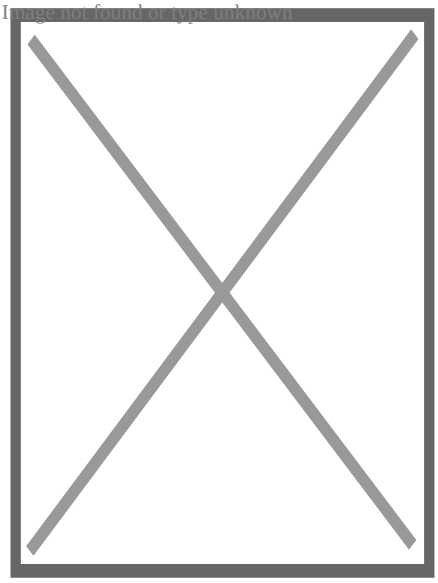

Full orthodontic headgear with headcap, fitting straps, facebow, and elastics

Whatever the purpose, orthodontic headgear works by exerting tension on the braces via hooks, a facebow, coils, elastic bands, metal orthodontic bands, and other attachable appliances directly into the patient's mouth. It is most effective for children and teenagers because their jaws are still developing and can be easily manipulated. (If an adult is fitted with headgear, it is usually to help correct the position of teeth that have shifted after other teeth have been extracted.) Thus, headgear is typically used to treat a number of jaw alignment or bite problems, such as overbite and underbite.[40]

Palatal expansion

[edit]

Palatal expansion can be best achieved using a fixed tissue-borne appliance. Removable appliances can push teeth outward but are less effective at maxillary sutural expansion. The effects of a removable expander may look the same as they push teeth outward, but they should not be confused with actually expanding the palate. Proper palate expansion can create more space for teeth as well as improve both oral and nasal airflow.[41]

Jaw surgery

[edit]

Jaw surgery may be required to fix severe malocclusions.[42] The bone is broken during surgery and stabilized with titanium (or bioresorbable) plates and screws to allow for healing to take place.[43] After surgery, regular orthodontic treatment is used to move the teeth into their final position.[44]

During treatment

[edit]

To reduce pain during the orthodontic treatment, low-level laser therapy (LLLT), vibratory devices, chewing adjuncts, brainwave music, or cognitive behavioral therapy can be used. However, the supporting evidence is of low quality, and the results are inconclusive.[45]

Post treatment

[edit]

After orthodontic treatment has been completed, there is a tendency for teeth to return, or relapse, back to their pre-treatment positions. Over 50% of patients have some reversion to pre-treatment positions within 10 years following treatment.[46] To prevent relapse, the majority of patients will be offered a retainer once treatment has been completed and will benefit from wearing their retainers. Retainers can be either fixed or removable.

Removable retainers

[edit]

Removable retainers are made from clear plastic, and they are custom-fitted for the patient's mouth. It has a tight fit and holds all of the teeth in position. There are many types of brands for clear retainers, including Zendura Retainer, Essix Retainer, and Vivera Retainer.[47] A Hawley retainer is also a removable orthodontic appliance made from a combination of plastic and metal that is custom-molded to fit the patient's mouth. Removable retainers will be worn for different periods of time, depending on the patient's need to stabilize the dentition.[48]

Fixed retainers

[edit]

Fixed retainers are a simple wire fixed to the tongue-facing part of the incisors using dental adhesive and can be specifically useful to prevent rotation in incisors. Other types of fixed retainers can include labial or lingual braces, with brackets fixed to the teeth.[48]

Palatal expander

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Palatal expander
Orthodontic headgear

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Orthodontic headgear

An X-ray taken for skull analysis

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An X-ray taken for skull analysis
Top (left) and bottom retainers

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Top (left) and bottom retainers

Clear aligners

[edit]

Clear aligners are another form of orthodontics commonly used today, involving removable plastic trays. There has been controversy about the effectiveness of aligners such as Invisalign or Byte; some consider them to be faster and more freeing than the alternatives.[49]

Training

[edit]

There are several specialty areas in dentistry, but the specialty of orthodontics was the first to be recognized within dentistry.[50] Specifically, the American Dental Association

recognized orthodontics as a specialty in the 1950s.[50] Each country has its own system for training and registering orthodontic specialists.

Australia

[edit]

In Australia, to obtain an accredited three-year full-time university degree in orthodontics, one will need to be a qualified dentist (complete an AHPRA-registered general dental degree) with a minimum of two years of clinical experience. There are several universities in Australia that offer orthodontic programs: the University of Adelaide, the University of Melbourne, the University of Sydney, the University of Queensland, the University of Western Australia, and the University of Otago.[51] Orthodontic courses are accredited by the Australian Dental Council and reviewed by the Australian Society of Orthodontists (ASO). Prospective applicants should obtain information from the relevant institution before applying for admission.[52] After completing a degree in orthodontics, specialists are required to be registered with the Australian Health Practitioner Regulation Agency (AHPRA) in order to practice.[53][54]

Bangladesh

[edit]

Dhaka Dental College in Bangladesh is one of the many schools recognized by the Bangladesh Medical and Dental Council (BM&DC) that offer post-graduation orthodontic courses.[55][56] Before applying to any post-graduation training courses, an applicant must have completed the Bachelor of Dental Surgery (BDS) examination from any dental college.[55] After application, the applicant must take an admissions test held by the specific college.[55] If successful, selected candidates undergo training for six months.[57]

Canada

[edit]

In Canada, obtaining a dental degree, such as a Doctor of Dental Surgery (DDS) or Doctor of Medical Dentistry (DMD), would be required before being accepted by a school for orthodontic training.[58] Currently, there are 10 schools in the country offering the orthodontic specialty.[58] Candidates should contact the individual school directly to obtain the most recent pre-requisites before entry.[58] The Canadian Dental Association expects orthodontists to complete at least two years of post-doctoral, specialty training in orthodontics in an accredited program after graduating from their dental degree.

United States

[edit]

Similar to Canada, there are several colleges and universities in the United States that offer orthodontic programs. Every school has a different enrollment process, but every applicant is required to have graduated with a DDS or DMD from an accredited dental school.[59][60] Entrance into an accredited orthodontics program is extremely competitive and begins by passing a national or state licensing exam.[61]

The program generally lasts for two to three years, and by the final year, graduates are required to complete the written American Board of Orthodontics (ABO) exam.[61] This exam is also broken down into two components: a written exam and a clinical exam.[61] The written exam is a comprehensive exam that tests for the applicant's knowledge of basic sciences and clinical concepts.[61] The clinical exam, however, consists of a Board Case Oral Examination (BCOE), a Case Report Examination (CRE), and a Case Report Oral Examination (CROE).[61] Once certified, certification must then be renewed every ten years.[61] Orthodontic programs can award a Master of Science degree, a Doctor of Science degree, or a Doctor of Philosophy degree, depending on the school and individual research requirements.[62]

United Kingdom

[edit]

This section **relies largely or entirely on a single source**. Relevant discussion may be found on the talk page. Please help improve this article by introducing citations to additional sources.
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Throughout the United Kingdom, there are several Orthodontic Specialty Training Registrar posts available.[63] The program is full-time for three years, and upon completion, trainees graduate with a degree at the Masters or Doctorate level.[63] Training may take place within hospital departments that are linked to recognized dental schools.[63] Obtaining a Certificate of Completion of Specialty Training (CCST) allows an orthodontic specialist to be registered under the General Dental Council (GDC).[63] An orthodontic specialist can provide care within a primary care setting, but to work at a hospital as an orthodontic consultant, higher-level training is further required as a post-CCST trainee.[63] To work within a university setting as an academic consultant, completing research toward obtaining a Ph.D. is also required.[63]

See also

[edit]

- Orthodontic technology
- Orthodontic indices
- List of orthodontic functional appliances
- Molar distalization
- Mouth breathing
- Obligate nasal breathing

Notes

[edit]

1. **^** Also referred to as *orthodontia*
2. **^** "Orthodontics" comes from the Greek *orthos* ('correct, straight') and *-odont-* ('tooth').[1]

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Orthodontics

Diagnosis	○ Bolton analysis ○ Cephalometric analysis ○ Cephalometry ○ Dentition analysis ○ Failure of eruption of teeth ○ Little's Irregularity Index ○ Malocclusion ○ Scissor bite ○ Standard anatomical position ○ Tooth ankylosis ○ Tongue thrust
Conditions	○ Overbite ○ Overjet ○ Open bite ○ Crossbite ○ Dental crowding ○ Dental spacing ○ Bimaxillary Protrusion ○ Prognathism ○ Retrognathism ○ Maxillary hypoplasia ○ Condylar hyperplasia ○ Overeruption ○ Mouth breathing ○ Temperomandibular dysfunction

Appliances	○ 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
Procedures	○ Anchorage (orthodontics) ○ Cantilever mechanics ○ Fiberotomy ○ Interproximal reduction ○ Intrusion (orthodontics) ○ Molar distalization ○ SARPE ○ Serial extraction
Materials	○ Beta-titanium ○ Nickel titanium ○ Stainless steel ○ TiMolium ○ Elgiloy ○ Ceramic ○ Composite ○ Dental elastics

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 ○ Earl W. Renfroe ○ Robert M. Ricketts ○ Alfred Paul Rogers ○ Ronald Roth ○ Everett Shapiro ○ L. F. Andrews ○ Frederick Lester Stanton

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

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Dentistry

Specialties	○ Endodontics ○ Oral and maxillofacial pathology ○ Oral and maxillofacial radiology ○ Oral and maxillofacial surgery ○ Orthodontics and dentofacial orthopedics ○ Pediatric dentistry ○ Periodontics ○ Prosthodontics ○ Dental public health ○ Cosmetic dentistry ○ Dental implantology ○ Geriatric dentistry ○ Restorative dentistry ○ Forensic odontology ○ Dental traumatology ○ Holistic dentistry

Dental surgery

- Dental extraction
- Tooth filling
- Root canal therapy
- Root end surgery
- Scaling and root planing
- Teeth cleaning
- Dental bonding
- Tooth polishing
- Tooth bleaching
- Socket preservation
- Dental implant

Organisations

- American Association of Orthodontists
- British Dental Association
- British Dental Health Foundation
- British Orthodontic Society
- Canadian Association of Orthodontists
- Dental Technologists Association
- General Dental Council
- Indian Dental Association
- National Health Service

By country

- Canada
- Philippines
- Israel
- United Kingdom
- United States

See also

- Index of oral health and dental articles
- Outline of dentistry and oral health
- Dental fear
- Dental instruments
- Dental material
- History of dental treatments
  - Ancient Rome
- Infant oral mutilation
- Mouth assessment
- Oral hygiene

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Cleft lip and cleft palate

Related specialities	○ Advance practice nursing ○ Audiology ○ 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
Related syndromes	○ Hearing loss with craniofacial syndromes ○ Pierre Robin syndrome ○ Popliteal pterygium syndrome ○ Van der Woude syndrome
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)
Authority control databases: National Image not found or type unknown **Edit this at Wikidata**	○ Germany ○ United States ○ Japan ○ Czech Republic ○ Israel

Portal:

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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

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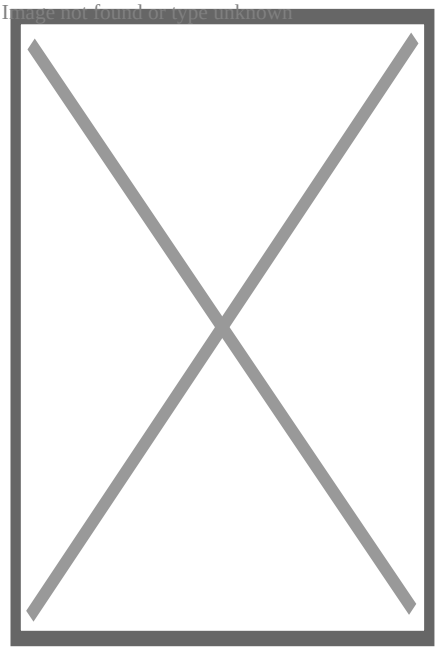

A dentist treats a patient with the help of a dental assistant.

Occupation

Names	○ Dentist ○ Dental Surgeon ○ Doctor [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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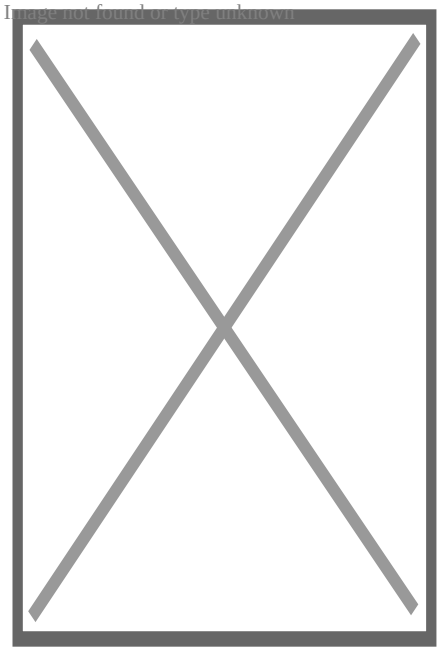


An oral surgeon and dental assistant removing a wisdom tooth

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: Ã¡Â½â‚¬??Ã•Â•? romanized: *odoús*, lit. 'tooth') – the study of the structure, development, and abnormalities of the teeth.

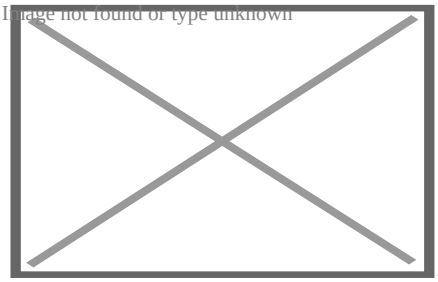
Dental treatment

[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.

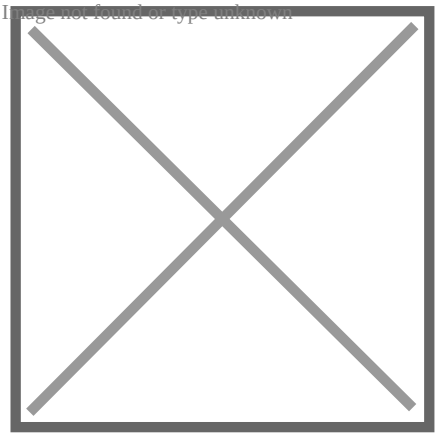


Irreversible enamel defects caused by an untreated celiac disease. They may be the only clue to its diagnosis, even in absence of gastrointestinal symptoms, but are often confused with fluorosis, tetracycline discoloration, acid reflux or other causes.[10][11][12] The National Institutes of Health include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

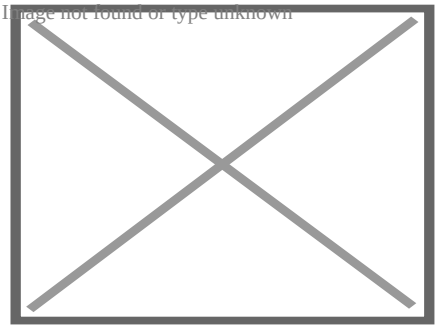
Dentists also encourage the prevention of oral diseases through proper hygiene and regular, twice or more yearly, checkups for professional cleaning and evaluation. Oral infections and inflammations may affect overall health and conditions in the oral cavity may be indicative of systemic diseases, such 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]

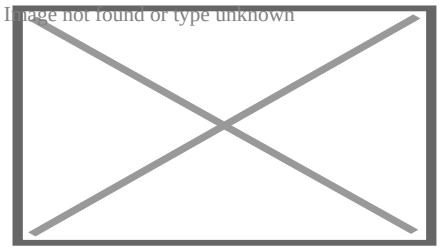
In the United Kingdom, the first dental schools, the London School of Dental Surgery and the Metropolitan School of Dental Science, both in London, opened in 1859.[21] The British Dentists Act of 1878 and the 1879 Dentists Register limited the title of "dentist" and "dental surgeon" to qualified and 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, BDSc) 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:

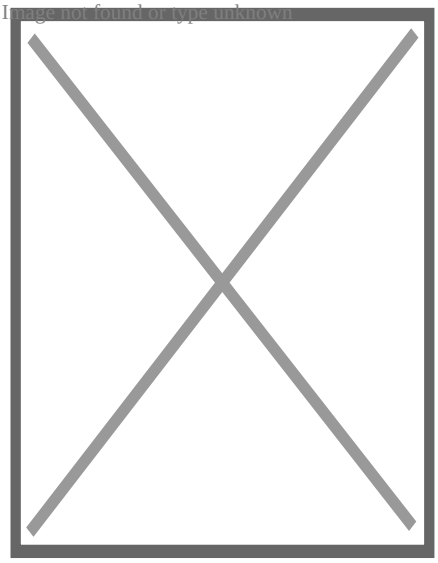
- Anesthesiology[28] – The specialty of dentistry that deals with the advanced use of general anesthesia, sedation and pain management to facilitate dental procedures.
- Cosmetic dentistry – Focuses on improving the appearance of the mouth, teeth and smile.
- Dental public health – The study of epidemiology 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.

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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]

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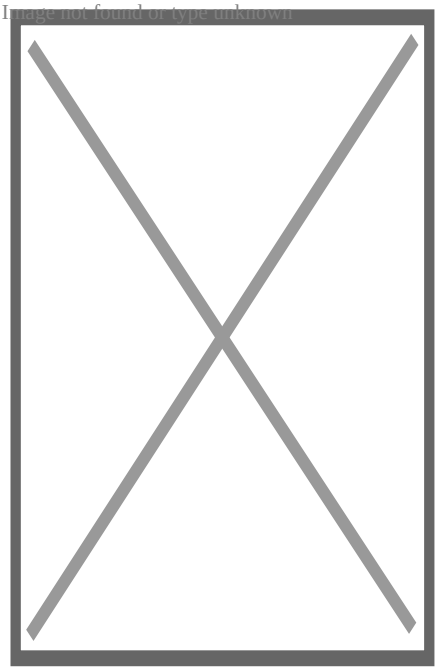

Dental needle-nose pliers designed by Fauchard in the late 17th century to use in prosthodontics

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

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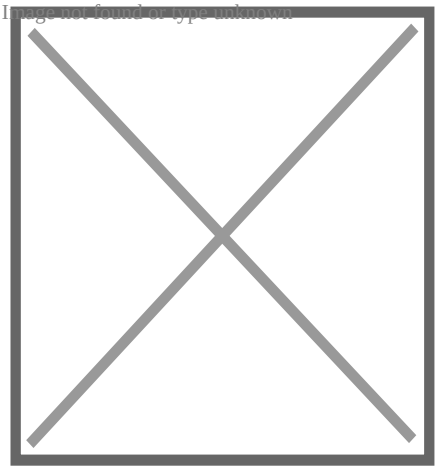

A microscopic device used in dental analysis, c. 1907

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]

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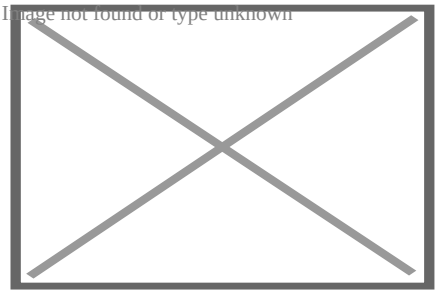
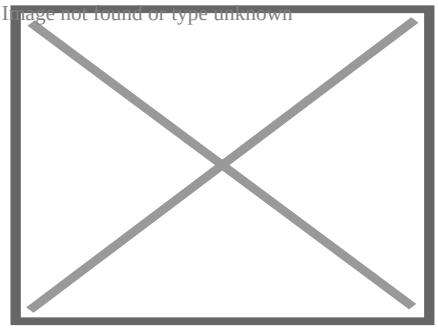


Panoramic radiograph of historic dental implants, made 1978

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.

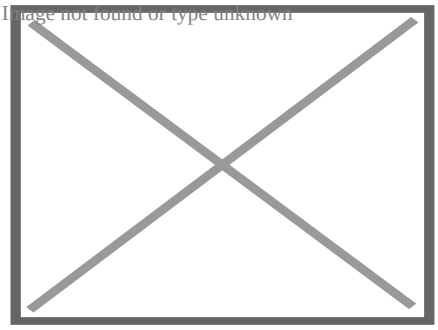
Within the field of dentistry, a variety of cleaning tools are used including piezoelectric and sonic scalers, and ultrasonic scalers and cleaners.[69] While a majority of the tools do not exceed 75 dBA,[70] prolonged exposure over many years can lead to hearing loss or complaints of tinnitus.[71] Few 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]

- icon 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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Dentistry

Specialties

- Endodontics
- Oral and maxillofacial pathology
- Oral and maxillofacial radiology
- Oral and maxillofacial surgery
- Orthodontics and dentofacial orthopedics
- Pediatric dentistry
- Periodontics
- Prosthodontics
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- Cosmetic dentistry
- Dental implantology
- Geriatric dentistry
- Restorative dentistry
- Forensic odontology
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- Dental extraction
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- Tooth polishing
- Tooth bleaching
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- Dental implant

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- British Dental Association
- British Dental Health Foundation
- British Orthodontic Society
- Canadian Association of Orthodontists
- Dental Technologists Association
- General Dental Council
- Indian Dental Association
- National Health Service

By country

- Canada
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See also

- Index of oral health and dental articles
- Outline of dentistry and oral health
- Dental fear
- Dental instruments
- Dental material
- History of dental treatments
  - Ancient Rome
- Infant oral mutilation
- Mouth assessment
- Oral hygiene

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Cleft lip and cleft palate

Related specialities	○ Advance practice nursing ○ Audiology ○ 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
Related syndromes	○ Hearing loss with craniofacial syndromes ○ Pierre Robin syndrome ○ Popliteal pterygium syndrome ○ Van der Woude syndrome
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
Australian and New Zealand dental schools	○ Sydney ○ Melbourne ○ Adelaide ○ Charles Sturt University ○ Griffith University ○ James Cook ○ La Trobe ○ Queensland ○ Western Australia ○ University of Otago

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Medicine

Specialties	**Surgery**	○ Cardiac surgery
		○ Cardiothoracic surgery
		○ Endocrine surgery
		○ Eye surgery
		○ General surgery
		  ○ Colorectal surgery
		  ○ Digestive system surgery
		○ Neurosurgery
		○ Oral and maxillofacial surgery
		○ Orthopedic surgery
		○ Hand surgery
		○ Otolaryngology
		  ○ ENT
		○ Pediatric surgery
		○ Plastic surgery
		○ Reproductive surgery
		○ Surgical oncology
		○ Transplant surgery
		○ Trauma surgery
		○ Urology
		  ○ Andrology
		○ Vascular surgery

	Internal medicine	○ Allergy / Immunology ○ Angiology ○ Cardiology ○ Endocrinology ○ Gastroenterology ○ Hepatology ○ Geriatrics ○ Hematology ○ Hospital medicine ○ Infectious diseases ○ Nephrology ○ Oncology ○ Pulmonology ○ Rheumatology
	Obstetrics and gynaecology	○ Gynaecology ○ Gynecologic oncology ○ Maternal–fetal medicine ○ Obstetrics ○ Reproductive endocrinology and infertility ○ Urogynecology

		○ Radiology
		  ○ Interventional radiology
		  ○ Neuroradiology
		  ○ Nuclear medicine
		○ 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

Related topics

- Alternative medicine
- Allied health
- Molecular oncology
- Nanomedicine
- Personalized medicine
- Public health
- Rural health
- Therapy
- Traditional medicine
- Veterinary medicine
- Physician
  - Chief physician
- History of medicine

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- **Role of Virtual Surgical Planning in Jaw Corrections**
- **Micro Osteoperforation and Its Effects on Treatment**
- **Potential Complications of Complex Jaw Adjustments**

Frequently Asked Questions

****In cases where surgery is necessary, what is the collaboration between orthodontists and surgeons based on skeletal analysis****

The collaboration between orthodontists and surgeons is based on a detailed plan that includes precise surgical movements and post-surgical orthodontic alignment. This collaboration is necessary to achieve both aesthetic and functional goals while ensuring long-term stability of the treatment.

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