Oral Hygiene

- **Reasons for Wearing Retainers After Treatment**
  Reasons for Wearing Retainers After Treatment Differences Between Removable and Fixed Retention Establishing a Routine to Prevent Tooth Shifting Oral Hygiene Tips for Retainer Care Monitoring Changes After Active Orthodontic Phase Factors That Influence Retention Duration Communicating the Value of Long Term Follow Ups How Retainers Support Jaw Positioning Over Time Signs That Signal the Need for Retainer Adjustments Materials Used in Crafting Effective Retainers Incorporating Retainer Wear Into Daily Habits Assessing Compliance and Its Impact on Stability
- **Basics of Brushing With Braces or Aligners**
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- **About Us**

Okay, so we're talking about how long your teeth stay straight after braces, right? A big piece of that puzzle is how well you, the patient, actually follow those instructions about wearing your retainer. I mean, it sounds simple enough: wear it as directed, and your teeth are probably going to stay where they're supposed to. Orthodontic check-ups help track the progress of tooth movement **Children's braces treatment** pediatric dentistry. But life happens, doesn't it?

Think about it. If your orthodontist says wear it full-time for six months, then only at night, and you're only wearing it a couple of nights a week... well, those teeth are going to start shifting. Compliance, or sticking to the plan, is huge. It's not just about remembering to wear it, either. It's about cleaning it properly, storing it safely so you don't lose or break it, and even communicating with your orthodontist if it's uncomfortable or doesn't fit right anymore.

Why is it so hard? Lots of reasons. Maybe you find the retainer uncomfortable, especially at first. Maybe you're self-conscious about wearing it during the day. Maybe you just plain forget. But think of all the time, effort, and money you invested in getting straight teeth. Sticking to the retainer schedule is the best way to protect that investment. Ultimately, the success of retention, and how long your smile stays perfect, rests heavily on your commitment to wearing that retainer as instructed. It's truly the final, and arguably most important, step in the whole orthodontic process.

Okay, so when we're talking about how long you'll need to wear your retainers after braces, one of the big factors is the type and severity of the malocclusion – basically, how messed up your teeth were to begin with. Think of it like this: the more complicated the puzzle, the more careful you have to be to keep it solved.

A mild crowding issue might be relatively quick to stabilize after treatment. Your teeth didn't have to move that far, and the surrounding tissues probably adapted pretty easily. But if you started with a severe overbite, a significant open bite, or teeth that were rotated way out of whack, things get trickier. These more complex cases often involve significant changes to the bone surrounding the teeth, the muscles in your face, and even the way you bite. That's a lot of stuff that needs to settle down and stay put.

The more dramatic the original problem, the greater the tendency for the teeth to want to shift back toward their old positions. Imagine stretching a rubber band really far – it's got a lot of stored energy and wants to snap back. Similarly, teeth that have been moved a long distance are more likely to relapse. So, a more severe initial malocclusion often translates to a longer,

and maybe even a lifetime, commitment to retention to keep everything nice and straight. It's not a punishment, just a recognition that some smiles need a little extra help to stay beautiful.

* Protecting the investment made in orthodontic treatment.

Okay, so we've straightened those pearly whites, shifted those bites into perfect harmony, and everyone's flashing a confident smile. But here's the thing about orthodontics: it's not a "one and done" deal. Retention is key, and how long that retention needs to last is where things get interesting. One of the big factors influencing retention duration? It's all about growth and development following orthodontic treatment.

Think of it like this. If a teenager finishes braces at 15, they're still growing. Their jaws are still changing, teeth are still settling, and that last growth spurt could nudge things around. This means that the initial orthodontic alignment is potentially vulnerable. We might need a longer retention period – maybe a permanent retainer on some teeth, or consistent nighttime wear of a removable retainer – to guide that final growth and make sure those teeth stay put. We're essentially trying to shepherd the teeth through those final developmental phases.

On the other hand, an adult who completes orthodontic treatment might be more stable, growth-wise. Their skeletal structure has matured, and the forces of growth are less likely to cause relapse. In these cases, maybe a shorter retention period is sufficient, or perhaps a less intensive retention protocol.

The point is, it's not a one-size-fits-all situation. The orthodontist needs to consider how much remaining growth is anticipated, and how that growth might impact the newly aligned teeth. It's a bit like predicting the weather – we can look at past patterns and current conditions to make an educated guess about what might happen. The more growth that's expected, the more diligent we need to be with retention, making sure those smiles stay beautiful for the long haul.

* Ensuring the long-term stability of the bite and smile.

Okay, so you've finally got your braces off. Congratulations! All that time, money, and occasional discomfort have paid off with a beautifully aligned smile. But here's the thing: keeping it that way isn't a given. We need to talk about the stability of that achieved orthodontic correction. Think of it like this: your teeth have memory. They've been nudged into

new positions, and they might just try to drift back to where they started.

The stability of your orthodontic result – basically, how likely it is to stay put – is a really big deal. It's not just about aesthetics; it's about long-term function and health. A relapse, where teeth shift, can lead to problems with your bite, jaw pain, and even increased risk of gum disease.

Now, there are a bunch of things that play a role in how stable your teeth are after treatment. How well your teeth fit together after the braces come off is crucial. If your bite still has some issues, like a deep overbite or a crossbite, the forces of chewing and jaw movement can push your teeth out of alignment. Think of it like trying to balance something on an uneven surface – it's just not going to stay put for long.

Then there's the soft tissue factor. Your lips, cheeks, and tongue all exert pressure on your teeth. If these pressures are imbalanced, they can cause teeth to shift. Tongue thrusting, for instance, where you push your tongue against your teeth when you swallow, can be a real culprit.

Growth is another big one, especially for younger patients. Our faces continue to grow and change well into adulthood, and this growth can sometimes affect the alignment of our teeth. That's why some people might need further minor adjustments later in life, even after having braces in their teens.

Finally, habits matter. Things like thumb sucking or nail biting can put pressure on your teeth and cause them to move. And of course, wearing your retainers religiously is absolutely key to maintaining that beautiful smile! It's a commitment, but it's worth it to protect your investment and enjoy the benefits of a properly aligned bite for years to come. So, listen to your orthodontist, wear your retainers, and be mindful of your habits – that's the recipe for long-term stability.

* Supporting proper jaw growth and development in younger children.

Okay, so picture this: you've just gotten your braces off, and you're beaming. That perfect smile is finally here! But the journey isn't quite over. You've entered the retention phase, and how well you take care of your mouth now can seriously impact how long that retainer stays in, and more importantly, how long your teeth stay put. We're talking about oral hygiene and periodontal health, which basically means keeping your gums and teeth squeaky clean and healthy.

Think of it like this: if you're not brushing and flossing religiously, plaque and bacteria are going to build up. This can lead to gingivitis, which is inflammation of the gums. Left unchecked, gingivitis can turn into periodontitis, a more serious infection that can eventually lead to bone loss around your teeth. Now, imagine trying to hold teeth in their new, perfectly aligned positions when the underlying support structure – your gums and bone – is compromised. It's like trying to build a house on a shaky foundation.

Poor oral hygiene and periodontal disease can actually cause teeth to shift and move, even with a retainer in place. This is because the inflammation and bone loss weaken the support around the teeth, making them more susceptible to relapse. Plus, inflamed gums can make wearing a retainer uncomfortable, leading to inconsistent wear, which, you guessed it, increases the risk of your teeth moving back to their old positions.

So, really, good oral hygiene isn't just about having a pretty smile; it's fundamentally linked to the success and duration of your retention phase. Diligent brushing, flossing, regular dental checkups, and professional cleanings will keep your gums healthy, your teeth stable, and your retainer doing its job effectively. Neglecting these things? Well, you might be looking at a longer retention period, or even needing further orthodontic treatment down the line. It's definitely worth putting in the effort to keep that hard-earned smile looking its best, and staying

that way!

* Avoiding the need for future, potentially more extensive, orthodontic intervention.

Factors That Influence Retention Duration: Choice of Retainer Type (Removable vs. Fixed)

Choosing between removable and fixed retainers isn't just about convenience; it significantly impacts how long you'll need to wear them. Think of it like this: a removable retainer, often a clear aligner or Hawley retainer, is like a part-time job for your teeth. It's effective when you're diligent about wearing it as prescribed. However, consistency is key. If you're prone to forgetting or simply slacking off, the teeth can gradually shift back, necessitating a longer overall retention period, or even requiring further orthodontic intervention. The success of removable retainers hinges heavily on patient compliance.

Fixed retainers, on the other hand, act like a permanent security guard for your teeth. They're bonded to the back surfaces of your front teeth, typically the lower ones, and provide continuous retention without relying on your memory or motivation. Because they're always in place, they can be particularly effective at preventing relapse, especially rotation of the lower incisors, a common issue after orthodontic treatment. This constant support can potentially shorten the overall retention duration needed, or at least ensure stability during a crucial initial period. However, fixed retainers require meticulous oral hygiene to prevent plaque buildup and gum disease, and they may be more prone to breakage, requiring repair or replacement.

Ultimately, the choice between removable and fixed retainers, and therefore the potential duration of retention, is a balancing act. It depends on the specific orthodontic issues addressed, the patient's commitment to following instructions, and their ability to maintain excellent oral hygiene. Your orthodontist will weigh these factors carefully to recommend the

most appropriate retainer type and retention protocol for your individual needs, aiming for long-term stability and a confident, lasting smile.

* Contributing to overall oral health by preventing crowding and misalignment.

Okay, so we're talking about retention after orthodontic treatment, and one of the things that really impacts how long teeth stay put is how well your muscles and nerves get used to the new bite. We call that "neuromuscular adaptation to the corrected occlusion." Sounds fancy, right? Basically, it means your jaw muscles, your tongue, and all the little sensors that tell your brain where your teeth are, need to get on board with the changes braces or aligners made.

Think about it: for months, maybe even years, your muscles were pulling your teeth in a certain way, used to a very specific bite. Then, BAM! Orthodontics comes along and shifts everything. Your muscles are still programmed to pull in the old direction. That's why relapse happens. So, the longer it takes for those muscles and nerves to rewire themselves and accept the new tooth positions as "normal," the greater the chance your teeth will try to wander back.

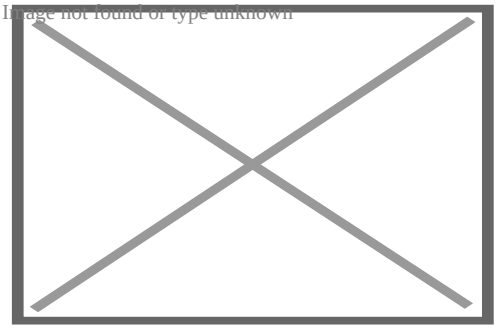
This adaptation isn't just about muscles getting stronger or weaker. It's about the whole system learning a new pattern. It involves the brain learning a new way to coordinate chewing, speaking, and even just resting your jaw. The better this learning process goes, the more stable your results will be. That's why some orthodontists recommend exercises to help retrain these muscles, or use retainers that encourage proper tongue posture.

Ultimately, neuromuscular adaptation is a slow burn. It doesn't happen overnight. It's a gradual process that needs time and consistency. That's why wearing your retainer as instructed is so crucial. It gives your muscles and nerves the constant feedback they need to solidify those new pathways and keep your smile where it belongs. If the neuromuscular system doesn't fully adapt, the forces will remain unbalanced and retention duration will be greatly impacted.

About pediatrics

This article is about the branch of medicine. For the journal, see Pediatrics (journal). For the branch of dentistry, see Pedodontics.

Pediatrics



A pediatrician examines a neonate.

Focus	**Infants, Children, Adolescents, and Young Adults**
Subdivisions	*Paediatric cardiology, neonatology, critical care, pediatric oncology, hospital medicine, primary care, others (see below)*
Significant diseases	Congenital diseases, Infectious diseases, Childhood cancer, Mental disorders
Significant tests	World Health Organization Child Growth Standards
Specialist	**Pediatrician**
Glossary	Glossary of medicine

Pediatrics (American English) also spelled **paediatrics** (British English), is the branch of medicine that involves the medical care of infants, children, adolescents, and young adults. In the United Kingdom, pediatrics covers many of their youth until the age of 18.[1] The American Academy of Pediatrics recommends people seek pediatric care through the age of 21, but some pediatric subspecialists continue to care for adults up to 25.[2][3] Worldwide age limits of pediatrics have been trending upward year after year.[4] A medical doctor who specializes in this area is known as a **pediatrician**, or **paediatrician**. The word *pediatrics* and its cognates mean "healer of children", derived from the two Greek words: ??Ã¡Â¿â€“? (*pais* "child") and Ã¡Â¼Â°???Ã•Å’?(*iatros* "doctor, healer"). Pediatricians work

in clinics, research centers, universities, general hospitals and children's hospitals, including those who practice pediatric subspecialties (e.g. neonatology requires resources available in a NICU).

History

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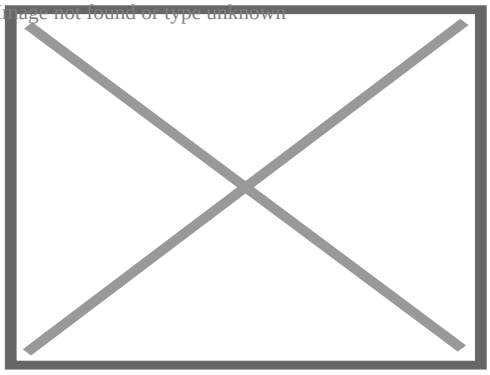

Part of Great Ormond Street Hospital in London, United Kingdom, which was the first pediatric hospital in the English-speaking world.

The earliest mentions of child-specific medical problems appear in the *Hippocratic Corpus*, published in the fifth century B.C., and the famous *Sacred Disease*. These publications discussed topics such as childhood epilepsy and premature births. From the first to fourth centuries A.D., Greek philosophers and physicians Celsus, Soranus of Ephesus, Aretaeus, Galen, and Oribasius, also discussed specific illnesses affecting children in their works, such as rashes, epilepsy, and meningitis.[5] Already Hippocrates, Aristotle, Celsus, Soranus, and Galen[6] understood the differences in growing and maturing organisms that necessitated different treatment: *Ex toto non sic pueri ut viri curari debent* ("In general, boys should not be treated in the same way as men").[7] Some of the oldest traces of pediatrics can be discovered in Ancient India where children's doctors were called *kumara bhrtya*.[6]

Even though some pediatric works existed during this time, they were scarce and rarely published due to a lack of knowledge in pediatric medicine. *Sushruta Samhita*, an ayurvedic text composed during the sixth century BCE, contains the text about pediatrics.[8] Another ayurvedic text from this period is *Kashyapa Samhita*.[9][10] A second century AD manuscript by the Greek physician and gynecologist Soranus of Ephesus dealt with neonatal pediatrics.[11] Byzantine physicians Oribasius, Aëtius of Amida, Alexander Trallianus, and Paulus Aegineta contributed to the field.[6] The Byzantines also built *brephotrophia* (crêches).[6] Islamic Golden Age writers served as a bridge for Greco-Roman and Byzantine medicine and added ideas of their own, especially Haly Abbas, Yahya Serapion, Abulcasis, Avicenna, and Averroes. The Persian philosopher and physician al-Razi (865–925), sometimes called the father of pediatrics, published a monograph on pediatrics titled *Diseases in Children*.[12][13] Also among the first books about pediatrics was *Libellus [Opusculum] de aegritudinibus et remediis infantium* 1472

("Little Book on Children Diseases and Treatment"), by the Italian pediatrician Paolo Bagellardo.[14][5] In sequence came Bartholomäus Metlinger's *Ein Regiment der Jungerkinder* 1473, Cornelius Roelans (1450–1525) no title Buchlein, or Latin compendium, 1483, and Heinrich von Louffenburg (1391–1460) *Versehung des Leibs* written in 1429 (published 1491), together form the *Pediatric Incunabula*, four great medical treatises on children's physiology and pathology.[6]

While more information about childhood diseases became available, there was little evidence that children received the same kind of medical care that adults did.[15] It was during the seventeenth and eighteenth centuries that medical experts started offering specialized care for children.[5] The Swedish physician Nils Rosén von Rosenstein (1706–1773) is considered to be the founder of modern pediatrics as a medical specialty,[16][17] while his work *The diseases of children, and their remedies* (1764) is considered to be "the first modern textbook on the subject".[18] However, it was not until the nineteenth century that medical professionals acknowledged pediatrics as a separate field of medicine. The first pediatric-specific publications appeared between the 1790s and the 1920s.[19]

Etymology

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The term pediatrics was first introduced in English in 1859 by Abraham Jacobi. In 1860, he became "the first dedicated professor of pediatrics in the world."[20] Jacobi is known as the *father of American pediatrics* because of his many contributions to the field.[21][22] He received his medical training in Germany and later practiced in New York City.[23]

The first generally accepted pediatric hospital is the *Hôpital des Enfants Malades* (French: *Hospital for Sick Children*), which opened in Paris in June 1802 on the site of a previous orphanage.[24] From its beginning, this famous hospital accepted patients up to the age of fifteen years,[25] and it continues to this day as the pediatric division of the Necker-Enfants Malades Hospital, created in 1920 by merging with the nearby *Necker Hospital*, founded in 1778.[26]

In other European countries, the Charité (a hospital founded in 1710) in Berlin established a separate Pediatric Pavilion in 1830, followed by similar institutions at Saint Petersburg in 1834, and at Vienna and Breslau (now WrocÃ…â€šaw), both in 1837. In 1852 Britain's first pediatric hospital, the Hospital for Sick Children, Great Ormond Street was founded by Charles West.[24] The first Children's hospital in Scotland opened in 1860 in Edinburgh.[27] In the US, the first similar institutions were the Children's Hospital of Philadelphia, which opened in 1855, and then Boston Children's Hospital (1869).[28] Subspecialties in pediatrics were created at the Harriet Lane Home at Johns Hopkins by Edwards A. Park[29]

Differences between adult and pediatric medicine

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The body size differences are paralleled by maturation changes. The smaller body of an infant or neonate is substantially different physiologically from that of an adult. Congenital defects, genetic variance, and developmental issues are of greater concern to pediatricians than they often are to adult physicians. A common adage is that children are not simply "little adults". The clinician must take into account the immature physiology of the infant or child when considering symptoms, prescribing medications, and diagnosing illnesses.[30]

Pediatric physiology directly impacts the pharmacokinetic properties of drugs that enter the body. The absorption, distribution, metabolism, and elimination of medications differ between developing children and grown adults.[30][31][32] Despite completed studies and reviews, continual research is needed to better understand how these factors should affect the decisions of healthcare providers when prescribing and administering medications to the pediatric population.[30]

Absorption

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Many drug absorption differences between pediatric and adult populations revolve around the stomach. Neonates and young infants have increased stomach pH due to decreased acid secretion, thereby creating a more basic environment for drugs that are taken by mouth.[31][30][32] Acid is essential to degrading certain oral drugs before systemic absorption. Therefore, the absorption of these drugs in children is greater than in adults due to decreased breakdown and increased preservation in a less acidic gastric space.[31]

Children also have an extended rate of gastric emptying, which slows the rate of drug absorption.[31][32]

Drug absorption also depends on specific enzymes that come in contact with the oral drug as it travels through the body. Supply of these enzymes increase as children continue to develop their gastrointestinal tract.[31][32] Pediatric patients have underdeveloped proteins, which leads to decreased metabolism and increased serum concentrations of specific drugs. However, prodrugs experience the opposite effect because enzymes are necessary for allowing their active form to enter systemic circulation.[31]

Distribution

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Percentage of total body water and extracellular fluid volume both decrease as children grow and develop with time. Pediatric patients thus have a larger volume of distribution than adults, which directly affects the dosing of hydrophilic drugs such as beta-lactam antibiotics like ampicillin.[31] Thus, these drugs are administered at greater weight-based doses or with adjusted dosing intervals in children to account for this key difference in body composition.[31][30]

Infants and neonates also have fewer plasma proteins. Thus, highly protein-bound drugs have fewer opportunities for protein binding, leading to increased distribution.[30]

Metabolism

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Drug metabolism primarily occurs via enzymes in the liver and can vary according to which specific enzymes are affected in a specific stage of development.[31] Phase I and Phase II enzymes have different rates of maturation and development, depending on their specific mechanism of action (i.e. oxidation, hydrolysis, acetylation, methylation, etc.). Enzyme capacity, clearance, and half-life are all factors that contribute to metabolism differences between children and adults.[31][32] Drug metabolism can even differ within the pediatric population, separating neonates and infants from young children.[30]

Elimination

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Drug elimination is primarily facilitated via the liver and kidneys.[31] In infants and young children, the larger relative size of their kidneys leads to increased renal clearance of medications that are eliminated through urine.[32] In preterm neonates and infants, their kidneys are slower to mature and thus are unable to clear as much drug as fully developed kidneys. This can cause unwanted drug build-up, which is why it is important to consider lower doses and greater dosing intervals for this population.[30][31] Diseases that negatively affect kidney function can also have the same effect and thus warrant similar

considerations.[31]

Pediatric autonomy in healthcare

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A major difference between the practice of pediatric and adult medicine is that children, in most jurisdictions and with certain exceptions, cannot make decisions for themselves. The issues of guardianship, privacy, legal responsibility, and informed consent must always be considered in every pediatric procedure. Pediatricians often have to treat the parents and sometimes, the family, rather than just the child. Adolescents are in their own legal class, having rights to their own health care decisions in certain circumstances. The concept of legal consent combined with the non-legal consent (assent) of the child when considering treatment options, especially in the face of conditions with poor prognosis or complicated and painful procedures/surgeries, means the pediatrician must take into account the desires of many people, in addition to those of the patient.[*citation needed*]

History of pediatric autonomy

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The term autonomy is traceable to ethical theory and law, where it states that autonomous individuals can make decisions based on their own logic.[33] Hippocrates was the first to use the term in a medical setting. He created a code of ethics for doctors called the *Hippocratic Oath* that highlighted the importance of putting patients' interests first, making autonomy for patients a top priority in health care.[34]

In ancient times, society did not view pediatric medicine as essential or scientific.[35] Experts considered professional medicine unsuitable for treating children. Children also had no rights. Fathers regarded their children as property, so their children's health decisions were entrusted to them.[5] As a result, mothers, midwives, "wise women", and general practitioners treated the children instead of doctors.[35] Since mothers could not rely on professional medicine to take care of their children, they developed their own methods, such as using alkaline soda ash to remove the vernix at birth and treating teething pain with opium or wine. The absence of proper pediatric care, rights, and laws in health care to prioritize children's health led to many of their deaths. Ancient Greeks and Romans sometimes even killed healthy female babies and infants with deformities since they had no adequate medical treatment and no laws prohibiting infanticide.[5]

In the twentieth century, medical experts began to put more emphasis on children's rights. In 1989, in the United Nations Rights of the Child Convention, medical experts developed the Best Interest Standard of Child to prioritize children's rights and best interests. This

event marked the onset of pediatric autonomy. In 1995, the American Academy of Pediatrics (AAP) finally acknowledged the Best Interest Standard of a Child as an ethical principle for pediatric decision-making, and it is still being used today.[34]

Parental authority and current medical issues

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The majority of the time, parents have the authority to decide what happens to their child. Philosopher John Locke argued that it is the responsibility of parents to raise their children and that God gave them this authority. In modern society, Jeffrey Blustein, modern philosopher and author of the book *Parents and Children: The Ethics of Family*, argues that parental authority is granted because the child requires parents to satisfy their needs. He believes that parental autonomy is more about parents providing good care for their children and treating them with respect than parents having rights.[36] The researcher Kyriakos Martakis, MD, MSc, explains that research shows parental influence negatively affects children's ability to form autonomy. However, involving children in the decision-making process allows children to develop their cognitive skills and create their own opinions and, thus, decisions about their health. Parental authority affects the degree of autonomy the child patient has. As a result, in Argentina, the new National Civil and Commercial Code has enacted various changes to the healthcare system to encourage children and adolescents to develop autonomy. It has become more crucial to let children take accountability for their own health decisions.[37]

In most cases, the pediatrician, parent, and child work as a team to make the best possible medical decision. The pediatrician has the right to intervene for the child's welfare and seek advice from an ethics committee. However, in recent studies, authors have denied that complete autonomy is present in pediatric healthcare. The same moral standards should apply to children as they do to adults. In support of this idea is the concept of paternalism, which negates autonomy when it is in the patient's interests. This concept aims to keep the child's best interests in mind regarding autonomy. Pediatricians can interact with patients and help them make decisions that will benefit them, thus enhancing their autonomy. However, radical theories that question a child's moral worth continue to be debated today.[37] Authors often question whether the treatment and equality of a child and an adult should be the same. Author Tamar Schapiro notes that children need nurturing and cannot exercise the same level of authority as adults.[38] Hence, continuing the discussion on whether children are capable of making important health decisions until this day.

Modern advancements

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According to the Subcommittee of Clinical Ethics of the Argentinean Pediatric Society (SAP), children can understand moral feelings at all ages and can make reasonable decisions based on those feelings. Therefore, children and teens are deemed capable of making their own health decisions when they reach the age of 13. Recently, studies made on the decision-making of children have challenged that age to be 12.[37]

Technology has made several modern advancements that contribute to the future development of child autonomy, for example, unsolicited findings (U.F.s) of pediatric exome sequencing. They are findings based on pediatric exome sequencing that explain in greater detail the intellectual disability of a child and predict to what extent it will affect the child in the future. Genetic and intellectual disorders in children make them incapable of making moral decisions, so people look down upon this kind of testing because the child's future autonomy is at risk. It is still in question whether parents should request these types of testing for their children. Medical experts argue that it could endanger the autonomous rights the child will possess in the future. However, the parents contend that genetic testing would benefit the welfare of their children since it would allow them to make better health care decisions.[39] Exome sequencing for children and the decision to grant parents the right to request them is a medically ethical issue that many still debate today.

Education requirements

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The examples and perspective in this section **deal primarily with United States and do not represent a worldwide view of the subject**. You may improve this section, discuss the issue on the talk page, or create a new section, as appropriate. *(September 2019) (Learn how and when to remove this message)*

Aspiring medical students will need 4 years of undergraduate courses at a college or university, which will get them a BS, BA or other bachelor's degree. After completing college, future pediatricians will need to attend 4 years of medical school (MD/DO/MBBS) and later do 3 more years of residency training, the first year of which is called "internship." After completing the 3 years of residency, physicians are eligible to become certified in pediatrics by passing a rigorous test that deals with medical conditions related to young children.[*citation needed*]

In high school, future pediatricians are required to take basic science classes such as biology, chemistry, physics, algebra, geometry, and calculus. It is also advisable to learn a foreign language (preferably Spanish in the United States) and be involved in high school

organizations and extracurricular activities. After high school, college students simply need to fulfill the basic science course requirements that most medical schools recommend and will need to prepare to take the MCAT (Medical College Admission Test) in their junior or early senior year in college. Once attending medical school, student courses will focus on basic medical sciences like human anatomy, physiology, chemistry, etc., for the first three years, the second year of which is when medical students start to get hands-on experience with actual patients.[40]

Training of pediatricians

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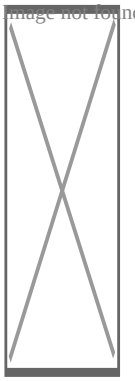
Pediatrics



Occupation	
Names	○ Pediatrician ○ Paediatrician
Occupation type	Specialty
Activity sectors	Medicine
Description	
Education required	○ Doctor of Medicine ○ Doctor of Osteopathic Medicine ○ Bachelor of Medicine, Bachelor of Surgery (MBBS/MBChB)
Fields of employment	Hospitals, Clinics

The training of pediatricians varies considerably across the world. Depending on jurisdiction and university, a medical degree course may be either undergraduate-entry or graduate-entry. The former commonly takes five or six years and has been usual in the Commonwealth. Entrants to graduate-entry courses (as in the US), usually lasting four or five years, have previously completed a three- or four-year university degree, commonly but by no means always in sciences. Medical graduates hold a degree specific to the country and university in and from which they graduated. This degree qualifies that medical practitioner to become licensed or registered under the laws of that particular country, and sometimes of several countries, subject to requirements for "internship" or "conditional

registration".

Pediatricians must undertake further training in their chosen field. This may take from four to eleven or more years depending on jurisdiction and the degree of specialization.

In the United States, a medical school graduate wishing to specialize in pediatrics must undergo a three-year residency composed of outpatient, inpatient, and critical care rotations. Subspecialties within pediatrics require further training in the form of 3-year fellowships. Subspecialties include critical care, gastroenterology, neurology, infectious disease, hematology/oncology, rheumatology, pulmonology, child abuse, emergency medicine, endocrinology, neonatology, and others.[41]

In most jurisdictions, entry-level degrees are common to all branches of the medical profession, but in some jurisdictions, specialization in pediatrics may begin before completion of this degree. In some jurisdictions, pediatric training is begun immediately following the completion of entry-level training. In other jurisdictions, junior medical doctors must undertake generalist (unstreamed) training for a number of years before commencing pediatric (or any other) specialization. Specialist training is often largely under the control of '*pediatric organizations* (see below) rather than universities and depends on the jurisdiction.

Subspecialties

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Subspecialties of pediatrics include:

(*not an exhaustive list*)

- Addiction medicine (multidisciplinary)
- Adolescent medicine
- Child abuse pediatrics
- Clinical genetics
- Clinical informatics
- Developmental-behavioral pediatrics
- Headache medicine
- Hospital medicine
- Medical toxicology
- Metabolic medicine
- Neonatology/Perinatology
- Pain medicine (multidisciplinary)
- Palliative care (multidisciplinary)
- Pediatric allergy and immunology
- Pediatric cardiology
    - Pediatric cardiac critical care
- Pediatric critical care

        - Neurocritical care
        - Pediatric cardiac critical care
    - Pediatric emergency medicine
    - Pediatric endocrinology
    - Pediatric gastroenterology
        - Transplant hepatology
    - Pediatric hematology
    - Pediatric infectious disease
    - Pediatric nephrology
    - Pediatric oncology
        - Pediatric neuro-oncology
    - Pediatric pulmonology
    - Primary care
    - Pediatric rheumatology
    - Sleep medicine (multidisciplinary)
    - Social pediatrics
    - Sports medicine

Other specialties that care for children

[edit]

(*not an exhaustive list*)

- Child neurology
    - Addiction medicine (multidisciplinary)
    - Brain injury medicine
    - Clinical neurophysiology
    - Epilepsy
    - Headache medicine
    - Neurocritical care
    - Neuroimmunology
    - Neuromuscular medicine
    - Pain medicine (multidisciplinary)
    - Palliative care (multidisciplinary)
    - Pediatric neuro-oncology
    - Sleep medicine (multidisciplinary)
- Child and adolescent psychiatry, subspecialty of psychiatry
- Neurodevelopmental disabilities
- Pediatric anesthesiology, subspecialty of anesthesiology
- Pediatric dentistry, subspecialty of dentistry
- Pediatric dermatology, subspecialty of dermatology
- Pediatric gynecology
- Pediatric neurosurgery, subspecialty of neurosurgery
- Pediatric ophthalmology, subspecialty of ophthalmology
- Pediatric orthopedic surgery, subspecialty of orthopedic surgery

- Pediatric otolaryngology, subspecialty of otolaryngology
- Pediatric plastic surgery, subspecialty of plastic surgery
- Pediatric radiology, subspecialty of radiology
- Pediatric rehabilitation medicine, subspecialty of physical medicine and rehabilitation
- Pediatric surgery, subspecialty of general surgery
- Pediatric urology, subspecialty of urology

See also

[edit]

- American Academy of Pediatrics
- American Osteopathic Board of Pediatrics
- Center on Media and Child Health (CMCH)
- Children's hospital
- List of pediatric organizations
- List of pediatrics journals
- Medical specialty
- Pediatric Oncall
- Pain in babies
- Royal College of Paediatrics and Child Health
- Pediatric environmental health

References

[edit]

1. **^** *"Paediatrics" (PDF). nhs.uk. Archived (PDF) from the original on 13 July 2020. Retrieved 2 July 2020.*
2. **^** *"Choosing a Pediatrician for Your New Baby (for Parents) - Nemours KidsHealth". kidshealth.org. Archived from the original on 14 July 2020. Retrieved 13 July 2020.*
3. **^** *"Age limits of pediatrics". Pediatrics.* ***81*** *(5): 736. May 1988. doi:10.1542/peds.81.5.736. PMID 3357740. S2CID 245164191. Archived from the original on 19 April 2017. Retrieved 18 April 2017.*
4. **^** *Sawyer, Susan M.; McNeil, Robyn; Francis, Kate L.; Matskarofski, Juliet Z.; Patton, George C.; Bhutta, Zulfiqar A.; Esangbedo, Dorothy O.; Klein, Jonathan D. (1 November 2019). "The age of paediatrics". The Lancet Child & Adolescent Health.* ***3*** *(11): 822–830. doi:10.1016/S2352-4642(19)30266-4. ISSN 2352-4642. PMID 31542355. S2CID 202732818.*
5. ^ ***a b c d e*** *Duffin, Jacalyn (2010). History of Medicine, Second Edition: A Scandalously Short Introduction. University of Toronto Press.*
6. ^ ***a b c d e*** *Colón, A. R.; Colón, P. A. (January 1999). Nurturing children: a history of pediatrics. Greenwood Press. ISBN 978-0-313-31080-5. Retrieved 20 October 2012.*
7. **^** Celsus, *De Medicina*, Book 3, Chapter 7, § 1.
8. **^** *John G. Raffensperger. Children's Surgery: A Worldwide History. McFarland. p. 21.*
9. **^** *David Levinson; Karen Christensen. Encyclopedia of modern Asia. Vol. 4. Charles Scribner's Sons. p. 116.*
10. **^** *Desai, A.B. Textbook Of Paediatrics. Orient blackswan. p. 1.*

11. **^** *Dunn, P. M. (1995). "Soranus of Ephesus (Circa AD 98-138) and perinatal care in Roman times". Archives of Disease in Childhood. Fetal and Neonatal Edition.* ***73*** *(1): F51 – F52. doi:10.1136/fn.73.1.f51. PMC 2528358. PMID 7552600.*
12. **^** *Elgood, Cyril (2010). A Medical History of Persia and The Eastern Caliphate (1st ed.). London: Cambridge. pp. 202–203. ISBN 978-1-108-01588-2. "By writing a monograph on 'Diseases in Children' he may also be looked upon as the father of paediatrics."*
13. **^** U.S. National Library of Medicine, "Islamic Culture and the Medical Arts, Al-Razi, the Clinician" [1] Archived 5 January 2018 at the Wayback Machine
14. **^** "*Achar S Textbook Of Pediatrics (Third Edition)*". A. B. Desai (ed.) (1989). p.1. ISBN 81-250-0440-8
15. **^** *Stern, Alexandra Minna; Markel, Howard (2002). Formative Years: Children's Health in the United States, 1880-2000. University of Michigan Press. pp. 23–24. doi:10.3998/mpub.17065. ISBN 978-0-472-02503-9. Archived from the original on 30 November 2021. Retrieved 30 November 2021.*
16. **^** *Lock, Stephen; John M. Last; George Dunea (2001). The Oxford illustrated companion to medicine. Oxford University Press US. p. 173. ISBN 978-0-19-262950-0. Retrieved 9 July 2010. "Rosen von Rosenstein."*
17. **^** *Roberts, Michael (2003). The Age of Liberty: Sweden 1719–1772. Cambridge University Press. p. 216. ISBN 978-0-521-52707-1. Retrieved 9 July 2010.*
18. **^** *Dallas, John. "Classics of Child Care". Royal College of Physicians of Edinburgh. Archived from the original on 27 July 2011. Retrieved 9 July 2010.*
19. **^** *Duffin, Jacalyn (29 May 2010). History of Medicine, Second Edition: A Scandalously Short Introduction. University of Toronto Press.*
20. **^** *Stern, Alexandra Minna; Markel, Howard (2002). Formative Years: Children's Health in the United States, 1880-2000. University of Michigan Press. pp. 23–24. doi:10.3998/mpub.17065. ISBN 978-0-472-02503-9. Archived from the original on 30 November 2021. Retrieved 30 November 2021.*
21. **^** "*Broadribb's Introductory Pediatric Nursing*". Nancy T. Hatfield (2007). p.4. ISBN 0-7817-7706-2
22. **^** *"Jacobi Medical Center - General Information". Archived from the original on 18 April 2006. Retrieved 6 April 2006.*
23. **^** *Kutzsche, Stefan (8 April 2021). "Abraham Jacobi (1830–1919) and his transition from political to medical activist". Acta Paediatrica.* ***110*** *(8): 2303–2305. doi:10.1111/apa.15887. ISSN 0803-5253. PMID 33963612. S2CID 233998658. Archived from the original on 7 May 2023. Retrieved 7 May 2023.*
24. ^ ***a b*** *Ballbriga, Angel (1991). "One century of pediatrics in Europe (section: development of pediatric hospitals in Europe)". In Nichols, Burford L.; et al. (eds.). History of Paediatrics 1850–1950. Nestlé Nutrition Workshop Series. Vol. 22. New York: Raven Press. pp. 6–8. ISBN 0-88167-695-0.*
25. **^** official history site (in French) of nineteenth century paediatric hospitals in Paris
26. **^** *"Introducing the Necker-Enfants Malades Hospital". Hôpital des Necker-Enfants Malades.*
27. **^** *Young, D.G. (August 1999). "The Mason Brown Lecture: Scots and paediatric surgery". Journal of the Royal College of Surgeons Edinburgh.* ***44*** *(4): 211–5.*

PMID 10453141. Archived from the original on 14 July 2014.

28. **^** *Pearson, Howard A. (1991). "Pediatrics in the United States". In Nichols, Burford L.; et al. (eds.). History of Paediatrics 1850–1950. Nestlé Nutrition Workshop Series. Vol. 22. New York: Raven Press. pp. 55–63. ISBN 0-88167-695-0.*
29. **^** *"Commentaries: Edwards A Park". Pediatrics.* ***44*** *(6). American Academy of Pediatrics: 897–901. 1969. doi:10.1542/peds.44.6.897. PMID 4903838. S2CID 43298798.*
30. ^ ***a b c d e f g h*** *O'Hara, Kate (2016). "Paediatric pharmacokinetics and drug doses". Australian Prescriber.* ***39*** *(6): 208–210. doi:10.18773/austprescr.2016.071. ISSN 0312-8008. PMC 5155058. PMID 27990048.*
31. ^ ***a b c d e f g h i j k l m*** *Wagner, Jonathan; Abdel-Rahman, Susan M. (2013). "Pediatric pharmacokinetics". Pediatrics in Review.* ***34*** *(6): 258–269. doi:10.1542/pir.34-6-258. ISSN 1526-3347. PMID 23729775.*
32. ^ ***a b c d e f*** *Batchelor, Hannah Katharine; Marriott, John Francis (2015). "Paediatric pharmacokinetics: key considerations". British Journal of Clinical Pharmacology.* ***79*** *(3): 395–404. doi:10.1111/bcp.12267. ISSN 1365-2125. PMC 4345950. PMID 25855821.*
33. **^** *Katz, Aviva L.; Webb, Sally A.; COMMITTEE ON BIOETHICS; Macauley, Robert C.; Mercurio, Mark R.; Moon, Margaret R.; Okun, Alexander L.; Opel, Douglas J.; Statter, Mindy B. (1 August 2016). "Informed Consent in Decision-Making in Pediatric Practice". Pediatrics.* ***138*** *(2): e20161485. doi:10.1542/peds.2016-1485. ISSN 0031-4005. PMID 27456510. S2CID 7951515.*
34. ^ ***a b*** *Mazur, Kate A.; Berg, Stacey L., eds. (2020). Ethical Issues in Pediatric Hematology/Oncology. pp. 13–21. doi:10.1007/978-3-030-22684-8. ISBN 978-3-030-22683-1. S2CID 208302429.*
35. ^ ***a b*** *Stern, Alexandra Minna; Markel, Howard (2002). Formative Years: Children's Health in the United States, 1880-2000. University of Michigan Press. pp. 23–24. doi:10.3998/mpub.17065. ISBN 978-0-472-02503-9. Archived from the original on 30 November 2021. Retrieved 30 November 2021.*
36. **^** *Friedman, Lainie Ross (2004). Children, families, and health care decision making. Clarendon Press. ISBN 0-19-925154-1. OCLC 756393117.*
37. ^ ***a b c*** *Martakis, K.; Schröder-Bäck, P.; Brand, H. (1 June 2018). "Developing child autonomy in pediatric healthcare: towards an ethical model". Archivos Argentinos de Pediatria.* ***116*** *(3): e401 – e408. doi:10.5546/aap.2018.eng.e401. ISSN 0325-0075. PMID 29756714. S2CID 46889502.*
38. **^** *Schapiro, Tamar (1 July 1999). "What Is a Child?". Ethics.* ***109*** *(4): 715–738. doi:10.1086/233943. ISSN 0014-1704. S2CID 170129444. Archived from the original on 30 November 2021. Retrieved 30 November 2021.*
39. **^** *Dondorp, W.; Bolt, I.; Tibben, A.; De Wert, G.; Van Summeren, M. (1 September 2021). '"We Should View Him as an Individual': The Role of the Child's Future Autonomy in Shared Decision-Making About Unsolicited Findings in Pediatric Exome Sequencing". Health Care Analysis.* ***29*** *(3): 249–261. doi:10.1007/s10728-020-00425-7. ISSN 1573-3394. PMID 33389383. S2CID 230112761.*
40. **^** *"What Education Is Required to Be a Pediatrician?". Archived from the original on 7 June 2017. Retrieved 14 June 2017.*

41. ^ *"CoPS". www.pedsubs.org. Archived from the original on 18 September 2013. Retrieved 14 August 2015.*

Further reading

[edit]

- *BMC Pediatrics* - open access
- *Clinical Pediatrics*
- *Developmental Review* - partial open access
- *JAMA Pediatrics*
- *The Journal of Pediatrics* - partial open access

External links

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Medicine

Specialties and subspecialties	**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
	Diagnostic	○ Radiology ○ ○ Interventional radiology ○ ○ Neuroradiology ○ ○ Nuclear medicine ○ Pathology ○ ○ Anatomical ○ ○ Clinical 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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Infants and their care

Health (Pediatrics)	○ Baby food ○ Birth weight ○ Breast pump ○ Breastfeeding ○ Breastfeeding and medications ○ Breastfeeding and mental health ○ Bottle feeding ○ Colic ○ Cradle cap ○ Esotropia ○ Failure to thrive ○ Immunization ○ Infant and toddler safety ○ Infant bathing ○ Infant feeding ○ Infant food safety ○ Infant formula ○ Infant massage ○ Infant respiratory distress syndrome ○ Infant sleep training ○ Neonatal intensive care unit ○ Newborn care and safety ○ Oral rehydration therapy ○ Pedialyte ○ Preterm birth ○ Shaken baby syndrome ○ Soy formula ○ SIDS

Development

- Attachment parenting
- Baby-led weaning
- Baby talk
- Babbling
- Birth defect
- Childbirth
- Crawling
- Gestational age
- Infant visual development
- Irritant diaper dermatitis
- Infant cognitive development
- Infant crying
- Kangaroo care
- Mother
- Nursery rhyme
- Object permanence
- Parent
- Parenting
- Peekaboo
- Play
- Prenatal development
- Prenatal development table
- Teething
- Walking
- Weaning

Socialization and Culture

- Attachment
- Babysitting
- Child abuse
- Child care
- Child custody
- Children's rights
  - UN Child rights
- Circumcision
- Foster care
- Grandparent visitation
- Infant swimming
- Milk bank
- Nanny
- Wet nurse

Infant care and equipment

- Baby bouncer
- Baby gate
- Baby monitor/Hidden camera
- Baby powder
- Baby shampoo
- Baby toy
- Baby walker
- Bib
- Baby swing
- Baby transport
- Bassinet
- Car seat safety
- Cloth diaper
- Cradle board
- Diaper
- Diaper bag
- Baby wipes
- Haberman Feeder
- High chair
- Infant bed *(American 'crib' and 'cradle', British 'cot')*
- Infant carrier
- Infant clothing
- Pacifier
- Playpen
- Stroller
- Supplemental nursing system
- Swaddling
- Swim diaper
- Teether
- Travel cot

Other topics

- Baby shower
- Babywearing
- Child neglect
- Closed adoption
- Cry room
- Infant ear piercing
- Open adoption
- Prenatal cocaine exposure
- Neonatal withdrawal syndrome
- Parental child abduction
- Parental responsibility
- Parenting plan
- Paternity
    - Paternity fraud

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About dental braces

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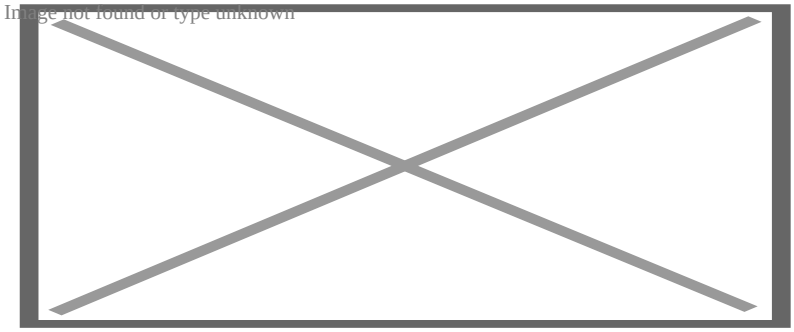


Dental braces

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

Process

[edit]

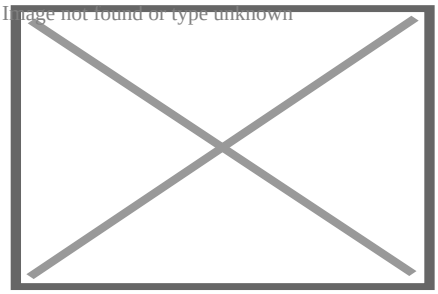
The application of braces moves the teeth as a result of force and pressure on the teeth. Traditionally, four basic elements are used: brackets, bonding material, arch wire, and ligature elastic (also called an "O-ring"). The teeth move when the arch wire puts pressure

on the brackets and teeth. Sometimes springs or rubber bands are used to put more force in a specific direction.[1]

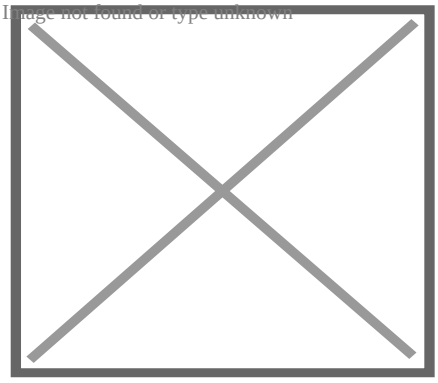
Braces apply constant pressure which, over time, moves teeth into the desired positions. The process loosens the tooth after which new bone grows to support the tooth in its new position. This is called bone remodelling. Bone remodelling is a biomechanical process responsible for making bones stronger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

Types

[edit]



"Clear" braces



Upper and Lower Jaw Functional Expanders

- ***Traditional metal wired*** *braces* (also known as "train track braces") are stainless-steel and are sometimes used in combination with titanium. Traditional metal braces are the most common type of braces.[4] These braces have a metal bracket with elastic ties (also known as rubber bands) holding the wire onto the metal brackets. The second-most common type of braces is self-ligating braces, which have a built-in

system to secure the archwire to the brackets and do not require elastic ties. Instead, the wire goes through the bracket. Often with this type of braces, treatment time is reduced, there is less pain on the teeth, and fewer adjustments are required than with traditional braces.
- ***Gold-plated stainless steel*** braces are often employed for patients allergic to nickel (a basic and important component of stainless steel), but may also be chosen for aesthetic reasons.
- ***Lingual*** *braces* are a cosmetic alternative in which custom-made braces are bonded to the back of the teeth making them externally invisible.
- ***Titanium*** *braces* resemble stainless-steel braces but are lighter and just as strong. People with allergies to nickel in steel often choose titanium braces, but they are more expensive than stainless steel braces.
- ***Customized orthodontic treatment systems*** combine high technology including 3-D imaging, treatment planning software and a robot to custom bend the wire. Customized systems such as this offer faster treatment times and more efficient results.[5]
- ***Progressive, clear removable aligners*** may be used to gradually move teeth into their final positions. Aligners are generally not used for complex orthodontic cases, such as when extractions, jaw surgery, or palate expansion are necessary.[*medical citation n*[6]]

Fitting procedure

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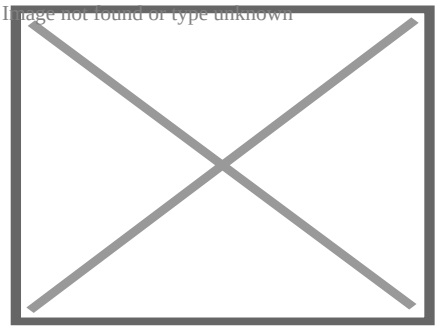


A patient's teeth are prepared for the application of braces.

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

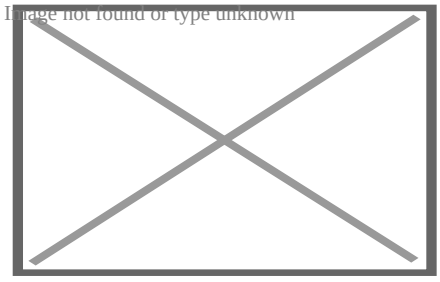
The first step is to determine whether braces are suitable for the patient. The doctor consults with the patient and inspects the teeth visually. If braces are appropriate, a records appointment is set up where X-rays, moulds, and impressions are made. These records are analyzed to determine the problems and the proper course of action. The use

of digital models is rapidly increasing in the orthodontic industry. Digital treatment starts with the creation of a three-dimensional digital model of the patient's arches. This model is produced by laser-scanning plaster models created using dental impressions. Computer-automated treatment simulation has the ability to automatically separate the gums and teeth from one another and can handle malocclusions well; this software enables clinicians to ensure, in a virtual setting, that the selected treatment will produce the optimal outcome, with minimal user input.[*medical citation needed*]

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

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

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



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

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

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

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

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

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

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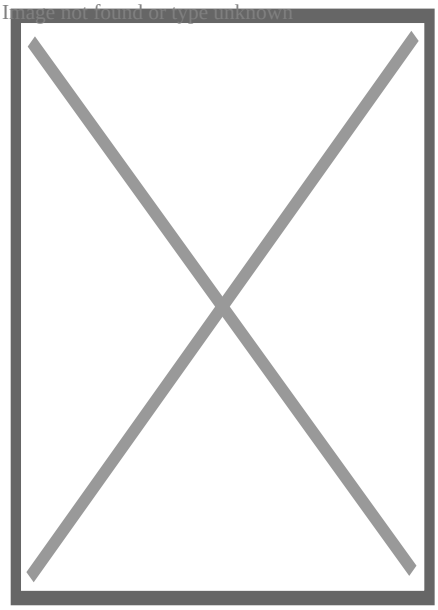

Young Colombian man during an adjustment visit for his orthodontics

Braces are typically adjusted every three to six weeks. This helps shift the teeth into the correct position. When they get adjusted, the orthodontist removes the coloured or metal ligatures keeping the arch wire in place. The arch wire is then removed and may be replaced or modified. When the archwire has been placed back into the mouth, the patient may choose a colour for the new elastic ligatures, which are then affixed to the metal brackets. The adjusting process may cause some discomfort to the patient, which is normal.

Post-treatment

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

Retainers

[edit]
Main article: Retainer (orthodontic device)

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

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

Headgear

[edit]
Main article: Orthodontic headgear

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

Orthodontic headgear usually consists of three major components:

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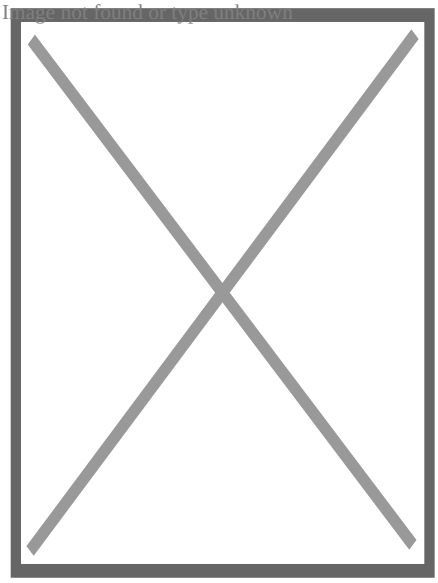


Full orthodontic headgear with head cap, fitting straps, facebow and elastics

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

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

Pre-finisher

[edit]

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

between the teeth, small spaces between the upper and lower jaw, and other minor problems.

Complications and risks

[edit]

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

Experiencing some pain following fitting and activation of fixed orthodontic braces is very common and several methods have been suggested to tackle this.[11][12] Pain associated with orthodontic treatment increases in proportion to the amount of force that is applied to the teeth. When a force is applied to a tooth via a brace, there is a reduction in the blood supply to the fibres that attach the tooth to the surrounding bone. This reduction in blood supply results in inflammation and the release of several chemical factors, which stimulate the pain response. Orthodontic pain can be managed using pharmacological interventions, which involve the use of analgesics applied locally or systemically. These analgesics are divided into four main categories, including opioids, non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol and local anesthesia. The first three of these analgesics are commonly taken systemically to reduce orthodontic pain.[13]

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

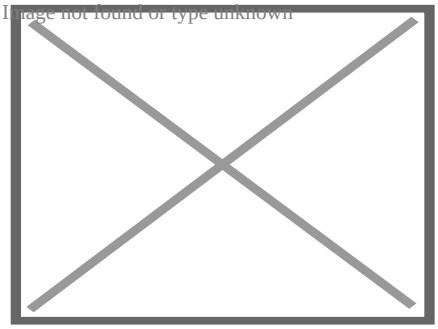
The dental displacement obtained with the orthodontic appliance determines in most cases some degree of root resorption. Only in a few cases is this side effect large enough to be considered real clinical damage to the tooth. In rare cases, the teeth may fall out or have to be extracted due to root resorption.[14][15]

History

[edit]

Ancient

[edit]



Old Braces at a museum in Jbeil, Lebanon

According to scholars and historians, braces date back to ancient times. Around 400–300 BC, Hippocrates and Aristotle contemplated ways to straighten teeth and fix various dental conditions. Archaeologists have discovered numerous mummified ancient individuals with what appear to be metal bands wrapped around their teeth. Catgut, a type of cord made from the natural fibres of an animal's intestines, performed a similar role to today's orthodontic wire in closing gaps in the teeth and mouth.[16]

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

18th century

[edit]

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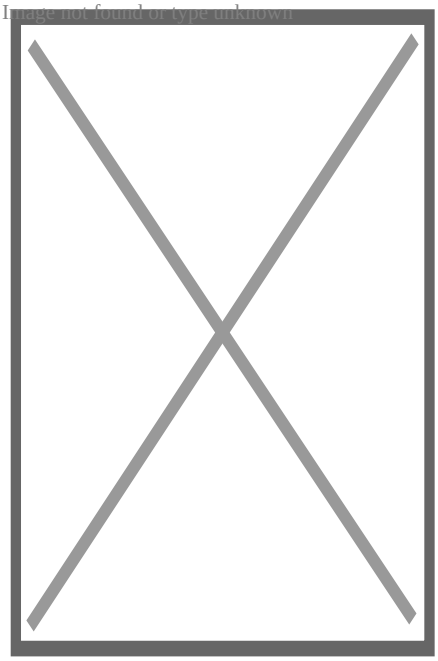

Portrait of Fauchard from his 1728 edition of *"The Surgical Dentist"*.

Orthodontics truly began developing in the 18th and 19th centuries. In 1669, French dentist Pierre Fauchard, who is often credited with inventing modern orthodontics, published a book entitled *"The Surgeon Dentist"* on methods of straightening teeth. Fauchard, in his practice, used a device called a "Bandeau", a horseshoe-shaped piece of iron that helped expand the palate. In 1754, another French dentist, Louis Bourdet, dentist to the King of France, followed Fauchard's book with *The Dentist's Art*, which also dedicated a chapter to tooth alignment and application. He perfected the "Bandeau" and was the first dentist on record to recommend extraction of the premolar teeth to alleviate crowding and improve jaw growth.

19th century

[edit]

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

In 1819, Christophe François Delabarre introduced the wire crib, which marked the birth of contemporary orthodontics, and gum elastics were first employed by Maynard in 1843. Tucker was the first to cut rubber bands from rubber tubing in 1850. Dentist, writer, artist, and sculptor Norman William Kingsley in 1858 wrote the first article on orthodontics and in

1880, his book, *Treatise on Oral Deformities*, was published. A dentist named John Nutting Farrar is credited for writing two volumes entitled, *A Treatise on the Irregularities of the Teeth and Their Corrections* and was the first to suggest the use of mild force at timed intervals to move teeth.

20th century

[edit]

In the early 20th century, Edward Angle devised the first simple classification system for malocclusions, such as Class I, Class II, and so on. His classification system is still used today as a way for dentists to describe how crooked teeth are, what way teeth are pointing, and how teeth fit together. Angle contributed greatly to the design of orthodontic and dental appliances, making many simplifications. He founded the first school and college of orthodontics, organized the American Society of Orthodontia in 1901 which became the American Association of Orthodontists (AAO) in the 1930s, and founded the first orthodontic journal in 1907. Other innovations in orthodontics in the late 19th and early 20th centuries included the first textbook on orthodontics for children, published by J.J. Guilford in 1889, and the use of rubber elastics, pioneered by Calvin S. Case, along with Henry Albert Baker.

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

See also

[edit]

- icon Medicine portal
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- Mandibular advancement splint
- Oral and maxillofacial surgery
- Orthognathic surgery
- Prosthodontics
- Trismus
- Dental implant

References

[edit]

1. ^ *"Dental Braces and Retainers". WebMD. Retrieved 2020-10-30.*
2. ^ *Robling, Alexander G.; Castillo, Alesha B.; Turner, Charles H. (2006). "Biomechanical and Molecular Regulation of Bone Remodeling". Annual Review of Biomedical Engineering.* ***8****: 455–498. doi:10.1146/annurev.bioeng.8.061505.095721. PMID 16834564.*
3. ^ *Toledo SR, Oliveira ID, Okamoto OK, Zago MA, de Seixas Alves MT, Filho RJ, et al. (September 2010). "Bone deposition, bone resorption, and osteosarcoma". Journal of Orthopaedic Research.* ***28*** *(9): 1142–1148. doi:10.1002/jor.21120. PMID 20225287. S2CID 22660771.*
4. ^ *"Metal Braces for Teeth: Braces Types, Treatment, Cost in India". Clove Dental. Retrieved 2025-02-06.*
5. ^ *Saxe, Alana K.; Louie, Lenore J.; Mah, James (2010). "Efficiency and effectiveness of SureSmile". World Journal of Orthodontics.* ***11*** *(1): 16–22. PMID 20209172.*
6. ^ *Tamer, Ã„Â°pek (December 2019). "Orthodontic Treatment with Clear Aligners and The Scientific Reality Behind Their Marketing: A Literature Review". Turkish Journal of Orthodontics.* ***32*** *(4): 241–246. doi:10.5152/TurkJOrthod.2019.18083. PMC 7018497. PMID 32110470.*
7. ^ *Millett DT, Mandall NA, Mattick RC, Hickman J, Glenny AM (February 2017). "Adhesives for bonded molar tubes during fixed brace treatment". The Cochrane Database of Systematic Reviews.* ***2*** *(3): CD008236. doi:10.1002/14651858.cd008236.pub3. PMC 6464028. PMID 28230910.*
8. ^ Rubie J Patrick (2017). "*What About Teeth After Braces?*" 2017 – "Health Journal Article" Toothcost Archived 2021-10-18 at the Wayback Machine
9. ^ *Naten, Joshua. "Braces Headgear (Treatments)". toothcost.com. Archived from the original on 19 October 2021.*
10. ^ *Boke, Fatma; Gazioglu, Cagri; Akkaya, Sevil; Akkaya, Murat (2014). "Relationship between orthodontic treatment and gingival health: A retrospective study". European Journal of Dentistry.* ***8*** *(3): 373–380. doi:10.4103/1305-7456.137651. ISSN 1305-7456. PMC 4144137. PMID 25202219.*
11. ^ *Eslamian L, Borzabadi-Farahani A, Hassanzadeh-Azhiri A, Badiee MR, Fekrazad R (March 2014). "The effect of 810-nm low-level laser therapy on pain caused by orthodontic elastomeric separators". Lasers in Medical Science.* ***29*** *(2): 559–64. doi:10.1007/s10103-012-1258-1. PMID 23334785. S2CID 25416518.*
12. ^ *Eslamian L, Borzabadi-Farahani A, Edini HZ, Badiee MR, Lynch E, Mortazavi A (September 2013). "The analgesic effect of benzocaine mucoadhesive patches on orthodontic pain caused by elastomeric separators, a preliminary study". Acta Odontologica Scandinavica.* ***71*** *(5): 1168–73. doi:10.3109/00016357.2012.757358. PMID 23301559. S2CID 22561192.*
13. ^ ***a b*** *Monk AB, Harrison JE, Worthington HV, Teague A (November 2017). "Pharmacological interventions for pain relief during orthodontic treatment". The Cochrane Database of Systematic Reviews.* ***11*** *(12): CD003976. doi:10.1002/14651858.cd003976.pub2. PMC 6486038. PMID 29182798.*
14. ^ *Artun J, Smale I, Behbehani F, Doppel D, Van't Hof M, Kuijpers-Jagtman AM (November 2005). "Apical root resorption six and 12 months after initiation of fixed*

orthodontic appliance therapy". The Angle Orthodontist. ***75*** *(6): 919–26. PMID 16448232.*
15. **^** *Mavragani M, Vergari A, Selliseth NJ, Bøe OE, Wisth PL (December 2000). "A radiographic comparison of apical root resorption after orthodontic treatment with a standard edgewise and a straight-wire edgewise technique". European Journal of Orthodontics.* ***22*** *(6): 665–74. doi:10.1093/ejo/22.6.665. PMID 11212602.*
16. **^** *Wahl N (February 2005). "Orthodontics in 3 millennia. Chapter 1: Antiquity to the mid-19th century". American Journal of Orthodontics and Dentofacial Orthopedics.* ***127*** *(2): 255–9. doi:10.1016/j.ajodo.2004.11.013. PMID 15750547.*
17. **^** *"NASA Technical Reports Server (NTRS)". Spinoff 1979. February 1979. Retrieved 2021-03-02.*

External links

[edit]

- Useful Resources: FAQ and Downloadable eBooks at Orthodontics Australia
- Orthos Explain: Treatment Options at Orthodontics Australia
- Image not found or type unknown Media related to Dental braces at Wikimedia Commons

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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 ○ Earl Emanuel Shepard ○ Cecil C. Steiner

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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About crossbite

Crossbite

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Unilateral posterior crossbite

Specialty	Orthodontics

In dentistry, **crossbite** is a form of malocclusion where a tooth (or teeth) has a more buccal or lingual position (that is, the tooth is either closer to the cheek or to the tongue) than its corresponding antagonist tooth in the upper or lower dental arch. In other words, crossbite is a lateral misalignment of the dental arches.[1][2]

Anterior crossbite

[edit]

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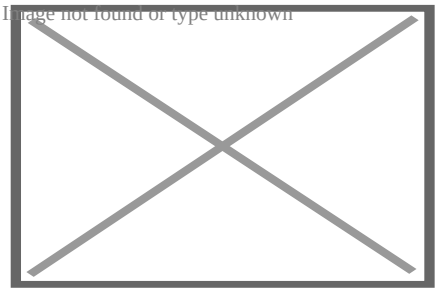

Class 1 with anterior crossbite

An anterior crossbite can be referred as negative overjet, and is typical of class III skeletal relations (prognathism).

Primary/mixed dentitions

[edit]

An anterior crossbite in a child with baby teeth or mixed dentition may happen due to either dental misalignment or skeletal misalignment. Dental causes may be due to displacement of one or two teeth, where skeletal causes involve either mandibular hyperplasia, maxillary hypoplasia or combination of both.

Dental crossbite

[edit]

An anterior crossbite due to dental component involves displacement of either maxillary central or lateral incisors lingual to their original erupting positions. This may happen due to delayed eruption of the primary teeth leading to permanent teeth moving lingual to their primary predecessors. This will lead to anterior crossbite where upon biting, upper teeth are behind the lower front teeth and may involve few or all frontal incisors. In this type of crossbite, the maxillary and mandibular proportions are normal to each other and to the cranial base. Another reason that may lead to a dental crossbite is crowding in the maxillary arch. Permanent teeth will tend to erupt lingual to the primary teeth in presence of crowding. Side-effects caused by dental crossbite can be increased recession on the buccal of lower incisors and higher chance of inflammation in the same area. Another term for an anterior crossbite due to dental interferences is *Pseudo Class III Crossbite or Malocclusion*.

Single tooth crossbite

[edit]

Single tooth crossbites can occur due to uneruption of a primary teeth in a timely manner which causes permanent tooth to erupt in a different eruption pattern which is lingual to the primary tooth.[3] Single tooth crossbites are often fixed by using a finger-spring based appliances.[4][5] This type of spring can be attached to a removable appliance which is used by patient every day to correct the tooth position.

Skeletal crossbite

[edit]

An anterior crossbite due to skeletal reasons will involve a deficient maxilla and a more hyperplastic or overgrown mandible. People with this type of crossbite will have dental compensation which involves proclined maxillary incisors and retroclined mandibular incisors. A proper diagnosis can be made by having a person bite into their centric relation will show mandibular incisors ahead of the maxillary incisors, which will show the skeletal discrepancy between the two jaws.[6]

Posterior crossbite

[edit]

Bjork defined posterior crossbite as a malocclusion where the buccal cusps of canine, premolar and molar of upper teeth occlude lingually to the buccal cusps of canine, premolar and molar of lower teeth.[7] Posterior crossbite is often correlated to a narrow maxilla and upper dental arch. A posterior crossbite can be unilateral, bilateral, single-tooth or entire segment crossbite. Posterior crossbite has been reported to occur between 7–23% of the population.[8][9] The most common type of posterior crossbite to occur is the unilateral crossbite which occurs in 80% to 97% of the posterior crossbite cases.[10][3] Posterior crossbites also occur most commonly in primary and mixed dentition. This type of crossbite usually presents with a *functional shift of the mandible towards the side of the crossbite*. Posterior crossbite can occur due to either skeletal, dental or functional abnormalities. One of the common reasons for development of posterior crossbite is the size difference between maxilla and mandible, where maxilla is smaller than mandible.[11] Posterior crossbite can result due to

- Upper Airway Obstruction where people with "adenoid faces" who have trouble breathing through their nose. They have an open bite malocclusion and present with development of posterior crossbite.[12]
- Prolong digit or suckling habits which can lead to constriction of maxilla posteriorly[13]
- Prolong pacifier use (beyond age 4)[13]

Connections with TMD

[edit]

Unilateral posterior crossbite

[edit]

Unilateral crossbite involves one side of the arch. The most common cause of unilateral crossbite is a narrow maxillary dental arch. This can happen due to habits such as digit sucking, prolonged use of pacifier or upper airway obstruction. Due to the discrepancy between the maxillary and mandibular arch, neuromuscular guidance of the mandible causes mandible to shift towards the side of the crossbite.[14] This is also known as Functional mandibular shift. This shift can become structural if left untreated for a long time during growth, leading to skeletal asymmetries. Unilateral crossbites can present with following features in a child

- Lower midline deviation[15] to the crossbite side
- Class 2 Subdivision relationships
- Temporomandibular disorders [16]

Treatment

[edit]

A child with posterior crossbite should be treated immediately if the child shifts their mandible on closing, which is often seen in a unilateral crossbite as mentioned above. The best age to treat a child with crossbite is in their mixed dentition when their palatal sutures have not fused to each other. Palatal expansion allows more space in an arch to relieve crowding and correct posterior crossbite. The correction can include any type of palatal expanders that will expand the palate which resolves the narrow constriction of the maxilla. [9] There are several therapies that can be used to correct a posterior crossbite: braces, 'Z' spring or cantilever spring, quad helix, removable plates, clear aligner therapy, or a Delaire mask. The correct therapy should be decided by the orthodontist depending on the type and severity of the crossbite.

One of the keys in diagnosing the anterior crossbite due to skeletal vs dental causes is diagnosing a CR-CO shift in a patient. An adolescent presenting with anterior crossbite may be positioning their mandible forward into centric occlusion (CO) due to the dental interferences. Thus finding their occlusion in centric relation (CR) is key in diagnosis. For anterior crossbite, if their CO matches their CR then the patient truly has a skeletal component to their crossbite. If the CR shows a less severe class 3 malocclusion or teeth not in anterior crossbite, this may mean that their anterior crossbite results due to dental interferences.[17]

Goal to treat unilateral crossbites should definitely include removal of occlusal interferences and elimination of the functional shift. Treating posterior crossbites early may help prevent the occurrence of Temporomandibular joint pathology.[18]

Unilateral crossbites can also be diagnosed and treated properly by using a Deprogramming splint. This splint has flat occlusal surface which causes the muscles to deprogram themselves and establish new sensory engrams. When the splint is removed, a proper centric relation bite can be diagnosed from the bite.[19]

Self-correction

[edit]

Literature states that very few crossbites tend to self-correct which often justify the treatment approach of correcting these bites as early as possible.[9] Only 0–9% of crossbites self-correct. Lindner et al. reported that 50% of crossbites were corrected in 76 four-year-old children.[20]

See also

[edit]

- List of palatal expanders
- Palatal expansion
- Malocclusion

References

[edit]

1. **^** *"Elsevier: Proffit: Contemporary Orthodontics · Welcome". www.contemporaryorthodontics.com. Retrieved 2016-12-11.*
2. **^** *Borzabadi-Farahani A, Borzabadi-Farahani A, Eslamipour F (October 2009). "Malocclusion and occlusal traits in an urban Iranian population. An epidemiological study of 11- to 14-year-old children". European Journal of Orthodontics. **31** (5): 477–84. doi:10.1093/ejo/cjp031. PMID 19477970.*
3. ^ ***a b*** *Kutin, George; Hawes, Roland R. (1969-11-01). "Posterior cross-bites in the deciduous and mixed dentitions". American Journal of Orthodontics. **56** (5): 491–504. doi:10.1016/0002-9416(69)90210-3. PMID 5261162.*
4. **^** *Zietsman, S. T.; Visagé, W.; Coetzee, W. J. (2000-11-01). "Palatal finger springs in removable orthodontic appliances--an in vitro study". South African Dental Journal. **55** (11): 621–627. ISSN 1029-4864. PMID 12608226.*
5. **^** *Ulusoy, Ayca Tuba; Bodrumlu, Ebru Hazar (2013-01-01). "Management of anterior dental crossbite with removable appliances". Contemporary Clinical Dentistry. **4** (2): 223–226. doi:10.4103/0976-237X.114855. ISSN 0976-237X. PMC 3757887.*

PMID 24015014.

6. **^** *Al-Hummayani, Fadia M. (2017-03-05). "Pseudo Class III malocclusion". Saudi Medical Journal.* ***37*** *(4): 450–456. doi:10.15537/smj.2016.4.13685. ISSN 0379-5284. PMC 4852025. PMID 27052290.*
7. **^** *Bjoerk, A.; Krebs, A.; Solow, B. (1964-02-01). "A Method for Epidemiological Registration of Malocculusion". Acta Odontologica Scandinavica.* ***22****: 27–41. doi:10.3109/00016356408993963. ISSN 0001-6357. PMID 14158468.*
8. **^** *Moyers, Robert E. (1988-01-01). Handbook of orthodontics. Year Book Medical Publishers. ISBN 9780815160038.*
9. ^ ***a b c*** *Thilander, Birgit; Lennartsson, Bertil (2002-09-01). "A study of children with unilateral posterior crossbite, treated and untreated, in the deciduous dentition--occlusal and skeletal characteristics of significance in predicting the long-term outcome". Journal of Orofacial Orthopedics.* ***63*** *(5): 371–383. doi:10.1007/s00056-002-0210-6. ISSN 1434-5293. PMID 12297966. S2CID 21857769.*
10. **^** *Thilander, Birgit; Wahlund, Sonja; Lennartsson, Bertil (1984-01-01). "The effect of early interceptive treatment in children with posterior cross-bite". The European Journal of Orthodontics.* ***6*** *(1): 25–34. doi:10.1093/ejo/6.1.25. ISSN 0141-5387. PMID 6583062.*
11. **^** *Allen, David; Rebellato, Joe; Sheats, Rose; Ceron, Ana M. (2003-10-01). "Skeletal and dental contributions to posterior crossbites". The Angle Orthodontist.* ***73*** *(5): 515–524. ISSN 0003-3219. PMID 14580018.*
12. **^** *Bresolin, D.; Shapiro, P. A.; Shapiro, G. G.; Chapko, M. K.; Dassel, S. (1983-04-01). "Mouth breathing in allergic children: its relationship to dentofacial development". American Journal of Orthodontics.* ***83*** *(4): 334–340. doi:10.1016/0002-9416(83)90229-4. ISSN 0002-9416. PMID 6573147.*
13. ^ ***a b*** *Ogaard, B.; Larsson, E.; Lindsten, R. (1994-08-01). "The effect of sucking habits, cohort, sex, intercanine arch widths, and breast or bottle feeding on posterior crossbite in Norwegian and Swedish 3-year-old children". American Journal of Orthodontics and Dentofacial Orthopedics.* ***106*** *(2): 161–166. doi:10.1016/S0889-5406(94)70034-6. ISSN 0889-5406. PMID 8059752.*
14. **^** *Piancino, Maria Grazia; Kyrkanides, Stephanos (2016-04-18). Understanding Masticatory Function in Unilateral Crossbites. John Wiley & Sons. ISBN 9781118971871.*
15. **^** *Brin, Ilana; Ben-Bassat, Yocheved; Blustein, Yoel; Ehrlich, Jacob; Hochman, Nira; Marmary, Yitzhak; Yaffe, Avinoam (1996-02-01). "Skeletal and functional effects of treatment for unilateral posterior crossbite". American Journal of Orthodontics and Dentofacial Orthopedics.* ***109*** *(2): 173–179. doi:10.1016/S0889-5406(96)70178-6. PMID 8638566.*
16. **^** *Pullinger, A. G.; Seligman, D. A.; Gornbein, J. A. (1993-06-01). "A multiple logistic regression analysis of the risk and relative odds of temporomandibular disorders as a function of common occlusal features". Journal of Dental Research.* ***72*** *(6): 968–979. doi:10.1177/00220345930720061301. ISSN 0022-0345. PMID 8496480. S2CID 25351006.*
17. **^** *COSTEA, CARMEN MARIA; BADEA, MÎNDRA EUGENIA; VASILACHE, SORIN; MESAROÃ…Å¾, MICHAELA (2016-01-01). "Effects of CO-CR discrepancy in daily*

*orthodontic treatment planning". Clujul Medical. **89** (2): 279–286. doi:10.15386/cjmed-538. ISSN 1222-2119. PMC 4849388. PMID 27152081.*

18. **^** *Kennedy, David B.; Osepchook, Matthew (2005-09-01). "Unilateral posterior crossbite with mandibular shift: a review". Journal (Canadian Dental Association). **71** (8): 569–573. ISSN 1488-2159. PMID 16202196.*
19. **^** *Nielsen, H. J.; Bakke, M.; Blixencrone-Møller, T. (1991-12-01). "[Functional and orthodontic treatment of a patient with an open bite craniomandibular disorder]". Tandlaegebladet. **95** (18): 877–881. ISSN 0039-9353. PMID 1817382.*
20. **^** *Lindner, A. (1989-10-01). "Longitudinal study on the effect of early interceptive treatment in 4-year-old children with unilateral cross-bite". Scandinavian Journal of Dental Research. **97** (5): 432–438. doi:10.1111/j.1600-0722.1989.tb01457.x. ISSN 0029-845X. PMID 2617141.*

External links

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Classification	○ **ICD-10**: K07.2 D ○ **ICD-9-CM**: 524.27

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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

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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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Dental disease involving the jaw

General	○ Jaw abnormality ○ malocclusion ○ Orthodontics
Size	○ Gnathitis ○ Micrognathism ○ Maxillary hypoplasia
Maxilla and Mandible	○ Cherubism ○ Congenital epulis ○ Torus mandibularis ○ Torus palatinus
Other	○ Jaw and base of cranium ○ Prognathism ○ Retrognathism ○ Dental arch ○ Crossbite ○ Overbite ○ Temporomandibular joint disorder

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