Accelerated Orthodontics

- **Innovative Approaches to Shorten Treatment Time**
  Innovative Approaches to Shorten Treatment Time The Role of Vibration Devices in Faster Tooth Movement Micro Osteoperforation and Its Effects on Treatment 3D Printing Techniques for Customized Appliances Benefits of Digital Impressions in Modern Orthodontics AI Assisted Treatment Planning for Precise Outcomes Remote Monitoring and Virtual Consultations Incorporating New Tools for Patient Compliance Practical Considerations of Accelerated Techniques Research Trends Shaping Future Orthodontic Practices Combining Traditional Methods With Cutting Edge Solutions Adapting to Technological Shifts in Orthodontic Care
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In orthodontic treatment for children, compliance is a critical element that significantly impacts the outcome and duration of the treatment. Braces help correct misaligned teeth in children **Child-friendly orthodontic solutions** jaw. Factors that affect compliance are multifactorial and can be influenced by both patient-related and practitioner-related variables. For children, especially those in the adolescent age group, compliance is often influenced by their personal experiences, perceptions, and social factors. For example, children under 12 years often show better compliance than older groups, as they are more likely to be influenced by parental attitudes and values[1][3]. However, as children age, their compliance levels may vary based on their own perceptions of treatment outcomes and the influence of peer-group standards[1][3]. Moreover, factors such as dental anxiety can lead to noncompliance, making communication and patient education important strategies to improve adherence[1][3]. Incorporating new patient compliance strategies, such as motivational techniques and improved communication, can help in reducing anxiety and improving treatment outcomes.

In recent years, the use of removable clear aligners has become more common, especially among children and adolescents. These aligners are less visually and behavior- related complex compared to fixed appliances, which can improve compliance by reducing the perceived inconvenience and social anxiety associated with wearing orthodontic appliances[2]. However, studies have shown that even with these less complex appliances, compliance can vary significantly based on individual patient profiles and psychological well-being[2]. This underlines the need for a more individualized and patient- specific compliance strategies that consider both psychological and social factors.

In terms of new compliance strategies, orthodontic practitioners are adopting methods such as positive communication, rewards for good compliance, and education about the benefits of adherence to treatment plans[1][3]. These strategies can be enhanced by using digital reminders and monitoring, which can help patients and their parents to better follow treatment instructions and appointment schedules. Moreover, improving the rapport between the practitioner and the patient is critical, as it can significantly influence patient satisfaction and compliance[1][3]. In the future, the use of digital health monitoring and personalization of treatment plans based on individual patient needs and psychological profiles may further improve compliance in orthodontic treatment for children.

In the complex and often long-term process of orthodontic treatment, patient compliance is a crucial factor that significantly influence the success of the treatment outcome. Factors such as dental anxiety, age, and socioeconomic status can all impact how well patients follow treatment plans. For children, compliance is often better when they are under the age of 12. This is because younger children are more likely to be influenced by parental attitudes and supervision, which can be a positive factor in ensuring they follow treatment instructions.

The Importance of Parental Attitude

The role of parents in orthodontic treatment compliance cannot be overemphasis. Parents who have a positive attitude toward treatment can encourage their children to comply with orthodontic instructions. This includes maintaining good oral hygiene, wearing appliances as prescribed, and following diet and appointment attendance instructions. Studies have shown that when parents are motivated and support the treatment process, children are more likely to be compliant, which in the long term, results in better treatment outcomes.

Inclusion of New Tools for Compliance

In recent years, there has been an increased focus on using new tools and strategies to improve patient compliance. These include patient-centered treatment plans that are designed based on individual patient needs and expectations. This approach emphasizes patient education and empowerment, ensuring that patients understand the importance of their role in the treatment process. Additionally, the use of rewards and verbal praise has been shown to encourage compliance, especially among adolescent patients. Incorporating these tools into orthodontic practice can help reduce anxiety and increase motivation, ultimately improving treatment outcomes.

The Psychological and Maturation Factors

During adolescence, patients often experience psychological changes that can affect their compliance. The transition from parental values to peer group standards can lead to resistance to authority, which may impact compliance. However, a positive relationship between the orthodontist and the patient can act as a surrogate parental influence, improving compliance. Understanding these psychological factors and addressing them with individualised methods can help clinicians better support their patients and improve treatment success.

In conclusion, patient compliance in orthodontic treatment is influenced by a variety of factors, and understanding these factors is crucial for improving treatment outcomes. Incorporating new tools and strategies that focus on patient education, empowerment, and psychological support can significantly improve compliance, especially among younger patients.

The HealthyStart System

The integration of new tools in healthcare settings is crucial for fostering patient compliance, and the roles of both the healthcare provider and the practice environment are essential in this process. Healthcare providers, including physicians, nurses, and pharmacists, are at the core of ensuring that patients understand and follow treatment regimens. They must employ effective communication skills to explain the importance of compliance and address any patient queries or barriers to following prescribed care.

Healthcare practices can enhance patient compliance by using advanced technology solutions. For example, digital patient engagement platforms like Twistle by Health Catalyst offer timely reminders and instructions via text messages, which help patients manage their medication regimens and visit scheduling more efficiently. These tools not only reduce the burden on healthcare providers but also improve patient outcomes by ensuring timely interventions and follow-up care.

Compliance software solutions, such as those provided by Healthicity and Radar Healthcare, also support healthcare providers by managing compliance risks and ensuring regulatory standards are meet. These tools help in identifying potential compliance issues, managing HIPAA-related tasks, and providing real-time reporting to improve organizational compliance.

The practice environment also benefits from standardized medication use evaluations (MUEs), which help identify potential medication-related problems and improve patient safety. MUEs facilitate the development of criteria for medication use based on current guidelines and literature, ensuring that healthcare professionals are well-informed and trained to address medication compliance issues.

The combined efforts of healthcare providers and the integration of new tools within the practice environment are critical for fostering a compliant and patient-friendly healthcare system. This not only promotes patient safety but also reduces the risk of non-compliance, which can have negative outcomes for both patients and healthcare organizations.

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

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

In the pursuit of effective healthcare, creating a patient-centered treatment plan is crucial for improving patient compliance. This approach not only enhances the doctor-patient relationship but also significantly impacts treatment outcomes. By tailoring education and communication to the individual needs of each patient, healthcare practitioners can empower patients to take an active role in their care.

A key component of this approach is fostering good doctor-patient rapport. When patients feel that their concerns are being recognized and their autonomy is being supported, they are more likely to adhere to treatment recommendations. This rapport is essential for patient satisfaction and compliance, as it encourages patients to trust their healthcare providers and feel more involved in their care.

In recent times, the use of technology has further supported this patient-centered approach. Tools such as patient portals and remote consultations can improve communication and make it easier for patients to manage their treatment plans. Additionally, strategies like simplifying medication regimens, using reminders, and offering personalized support can significantly enhance patient compliance.

In cancer care, for example, patient-centered communication is recognized as a critical factor in ensuring that patients engage in health-enhancing behaviors and adhere to treatment plans. By understanding the social and psychological needs of patients, healthcare providers can create more effective communication strategies that lead to better health outcomes.

In practice, building trust and rapport can be achieved by practicing patient-centered care, where healthcare providers take the time to listen to patients, respect their concerns, and treat them with dignity. This approach not only enhances patient compliance but also promotes a collaborative environment where patients feel empowered to manage their health effectively.

In the end, the ability of practitioners to create personalized treatment plans, supported by effective communication and education, is vital for improving patient compliance. By fostering a supportive and collaborative healthcare environment, we can move towards better health outcomes and make patient compliance the norm, not the exception.

Myobrace: A No-Braces Approach

As healthcare systems face the ongoing need to enhance patient compliance, the use of technology has become a crucial strategy. New tools designed to improve patient compliance are not only making healthcare more accessible but also more effective. For instance, automated medication management systems and digital patient engagement tools are being used to advance equitable access to medications and close care gaps. Such tools help identify patients who require specific medications and track their adherence, ensuring that care teams can provide timely support.

Technology like Twistle by Health Catalyst offers patient engagement solutions through text messaging, which simplifies communication by providing reminders for office visits, lab tests, and health maintenance screenings. This not only reduces the burden on healthcare providers but also enhances patient engagement by making communication more accessible across different demographics.

Medication compliance is further supported by tools that streamline the process of refilling prescriptions, providing transparency for clinicians to manage patients' overall health better. Embedded Refills and similar systems allow for real-time monitoring and analysis of patient adherence, which is critical for managing chronic care and disease management.

The use of these tools also has a direct and substantial long-term outcome: reducing physician burnout by automating tasks and ensuring that patients receive the necessary care without the need for extensive follow-up calls or visits. This not only saves time but also enhances the quality of care by ensuring that patients are more compliant with their treatment plans.

As healthcare compliance software solutions like MedTrainer and Healthicity focus on managing regulatory requirements and risk assessments, they also support the overall compliance environment necessary for effective patient care. This comprehensive support for both patient and provider compliance is crucial for fostering a more effective and patient-centered healthcare system.

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

The management of patient compliance is a complex challenge in healthcare, particularly when dealing with non-compliant patients. Incorporating new tools such as bone-borne anchors and other non-compliance techniques can provide innovative solutions to manage treatment without relying solely on patient participation. However, these techniques are not completely effective without some level of patient compliance.

Non-compliance can arise from a variety of factors, including lack of understanding, cost, and trust issues between patients and healthcare providers. For example, patients may not fully comprehend their treatment plans or may struggle with the cost of medications, leading to unintentionally non-adherent behavior. In mental health settings, non-compliance is particularly prevalent, with factors like denial or lack of awareness of one's condition furthering the challenge.

To address these issues, healthcare professionals must develop a rapport with their patients through open communication and understanding. This includes empathizing with the challenges patients face and taking the time to explain treatment plans clearly. Additionally, using technology to enhance patient engagement and medication adherence can be crucial.

Tools like automated medication management and digital patient engagement software can help streamline communication and improve compliance by providing timely reminders and educational support.

Non-compliance techniques, such as using bone-borne anchors, can be effective in managing treatment outcomes when patient participation is limited. However, these methods are most effective when combined with efforts to improve patient understanding and engagement. By fostering a culture of trust and ensuring that patients are well-informed about their treatment options, healthcare providers can increase the overall compliance and improve treatment outcomes.

The use of healthcare compliance software also offers a structured way to manage and document compliance efforts. These systems can help identify and address compliance risks, manage HIPAA-related issues, and provide training to staff members. By using these tools in coordination with non-compliance techniques, healthcare organizations can create a more comprehensive and effective compliance strategy.

Understanding the reasons behind non-compliance and using a variety of tools and techniques to address these challenges can help healthcare providers manage treatment more efficiently. While new tools and techniques are valuable, they work best when combined with a patient-first, engagement-based strategy that aims to improve patient understanding and participation in their care.

Comprehensive Orthodontic Solutions

In the context of patient compliance, physical and behavioral factors play a crucial role in determining how well individuals adhere to their treatment plans. Compliance is not just about following medication regimens; it also includes engaging in lifestyle changes, such as increased physical activity or healthier eating, as advised by healthcare professionals.

Understanding Compliance

Patient compliance refers to the degree to which a patient correctly follows their physician's medical advice. This includes adherence to medication, use of medical devices, self-care practices, and engagement in non-pharmacological treatments like physical therapy or cognitive behavioral therapy. The success of treatment outcomes is significantly associated with patient compliance, as noncompliance can lead to ineffective treatment, disease progression, and increased healthcare costs[1][3]. For example, a study found that about 30 to 50% of patients do not comply with their treatment plans, which results in substantial avoidable healthcare costs[3]. This underscores the importance of addressing the factors that influence compliance.

In Incorporating New Tools for Patient Compliance

In recent times, new tools and strategies have been implemented to enhance patient compliance. These include using technology to monitor and support patient adherence, such as mobile health (M- Health) interventions and cognitive assessments administered via email[1]. For cognitive assessments, ensuring that the platform is user-friendly and accessible is crucial to encourage patient engagement. This can involve having auditory instructions and technical support available to help patients understand and participate in assessments more reliably[1]. Additionally, videoconferencing can be used to regularly observe patients and provide them with the necessary support and guidance to adhere to their treatment plans[1]. These tools not only improve the accuracy of cognitive assessments but also provide healthcare providers with detailed data to track treatment efficacy and patient cognitive function.

Addressing Barriers to Compliance

One of the significant barriers to compliance is poor health literacy. Patients may not understand the benefits of their treatment or may be limited by complex medication regimens[1]. Cognitive and emotional factors also influence compliance, particularly in chronic

conditions like pain management[1]. To address these barriers, healthcare providers can improve patient education by using clear, accessible language and visual materials. This can include educational videos or interactive online resources that explain the disease process and treatment options in a way that is easy for patients to understand[1]. By simplifying treatment regimens and using reminders through text messages or emails, healthcare providers can make it easier for patients to adhere to their prescribed plans[1]. For example, transitioning to simplified medication packaging like blister packs has been shown to significantly improve adherence rates[1]. Additionally, fostering a supportive patient-physician relationship can enhance patient satisfaction and encourage active involvement in their care[1]. This relationship is crucial as it respects the patient's autonomy and encourages them to take an active role in managing their health.

The Interactions of Cognitive and Learning Disabilities

In the context of web accessibility, guidelines like the Web Content Accessibility Guidelines (WCAG) emphasize the importance of creating content that is accessible to individuals with cognitive and learning disabilities[2]. This includes ensuring that web content is understandable and operable for users with various disabilities. By addressing these needs, healthcare providers can develop tools and resources that are more accessible and user-friendly for a wider range of patients, potentially improving compliance by reducing barriers to understanding and engagement.

In the end, enhancing patient compliance requires a multi-step process that includes improving patient education, reducing barriers to treatment, and using technology to support adherence. By addressing physical and behavioral factors and

In the complex field of patient compliance, understanding the psychological and social factors that influence adherence is essential for clinicians. A significant body of research suggests that gender can play a role in compliance, with some studies highlighting that women are often more compliant than men. This gender-based compliance can be influenced by a variety of factors, including psychological aspects such as self-esteem and future expectations.

Psychological factors are critical in understanding patient behavior. Positive psychological states, such as high self-esteem and positive future expectations, can enhance a patient's motivation and self-efficacy, leading to better adherence to treatment plans. In contrary, low self-esteem or a lack of positive future expectations can lead to demotivation and non-compliance. For example, patients with high self-esteem may feel more in control of their health, which can improve their ability to follow prescribed regimens.

Understanding these psychological factors can help clinicians tailor their approaches to improve patient compliance. For example, building trust and providing clear, empathetic communication can positively influence a patient's psychological state and lead to better outcomes. Furthermore, involving patients in the decision-making process and ensuring they feel heard can enhance their sense of control and motivation, leading to improved adherence.

In addition to psychological factors, social support and the patient-provider relationship also play significant roles in compliance. Women, who often have stronger social networks and may be more likely to engage in communal goals, may have an additional support system that helps them adhere to treatment plans. This social support can be a critical factor in improving compliance, as it can provide both practical and psychological benefits.

In the future, clinicians should focus on creating personalized treatment plans that take into considerations both the psychological and social factors influencing patient behavior. This approach can help predict and improve compliance, leading to better health outcomes for all patients.

In the healthcare industry, patient-centered treatment planning is a model that focuses on the individual needs, preferences, and values of each patient. This approach not only considers the clinical aspects of care but also the emotional, social, and financial factors that affect a patient's life. By adopting patient-centered treatment planning, healthcare providers can enhance patient engagement, improve health outcomes, and promote better adherence to treatment.

In recent healthcare settings, the integration of patient-centered care with tools designed to enhance patient engagement has become more common. These tools often include data-driven software that helps clinicians involve patients more directly in their care, providing them with the necessary education to make informed decisions about their health. This approach also includes emotional support, family involvement, and continuity in care planning, ensuring that all aspects of a patient's needs are consistently supported.

In terms of patient adherence, research has shown that patient-centered interactions lead to improved health outcomes and better treatment adherence. By individualizing patient care and actively including patients in decision-making, healthcare providers can create a more effective partnership with their patients. This partnership is based on shared decision-making, clear communication, and a focus on patient education, all of which are fundamental to ensuring that patients feel supported and involved in their treatment.

The use of patient-centered treatment planning also aligns with the principles of patient-centered care developed by organizations like the Picker Institute. These principles emphasize timely access to care, treatment by trustworthy professionals, care continuity, and patient involvement in decision-making. By adopting these principles and using the right tools, healthcare providers can create a more patient-centric approach that not only focuses on medical outcomes but also on the overall well-being of the patient.

In the end, patient-centered treatment planning is about creating a care model that is both effective and patient-focused. By using tools that enhance patient engagement and adherence, healthcare providers can improve the quality of care and lead to better health outcomes for their patients. This approach not only benefits the patients but also helps healthcare providers to deliver more effective and comprehensive care.

In the healthcare system, adopting a patient-centered approach is essential for ensuring that patients receive care tailored to their unique needs and expectations. This approach places a responsibility on practitioners to understand and address individual patient needs, which includes regular progress evaluation and consultation with patients and their families. The goal is to improve compliance by making patients active participants in their care journey.

Patient-centered care is grounded in the principles of respect, clear communication, and emotional support. It emphasizes the importance of treating patients with dignity and honoring their values and preferences throughout the care process. This approach integrates family and community support, shifting the focus from specific medical conditions to a holistic view of the patient's well-being. Practitioners work to develop individualized, comprehensive care plans that address both physical and mental health needs.

In practice, patient-centered care often leads to higher patient satisfaction and better health outcomes. It fosters trust between patients and healthcare providers, which is particularly beneficial for patients with chronic conditions who require lifelong care and self-management. Tools such as regular progress evaluation and consultation help practitioners assess how well patients are following their treatment plans and make necessary adjustments.

To enhance patient compliance, healthcare providers must invest in open and transparent communication. This includes educating patients about their conditions, treatment options, and the importance of adherence to prescribed care plans. Patients who feel informed and respected are more likely to take responsibility for their health, adhere to treatment recommendations, and advocate for their needs.

In the end, a patient-centered approach not only improves compliance but also empowers patients to become active partners in their healthcare. This collaborative model of care is essential for creating a more compassionate and effective healthcare system that prioritizes the needs and expectations of each individual patient.

The term "edication and support" can be applied to the process of enhancing patient compliance through the use of innovative tools and technologies. In the healthcare system, patient compliance is a key element in ensuring that patients follow their treatment and medication schedules as intended by healthcare providers. Incorporating new tools for patient compliance not only serves to improve health outcomes but also provides a structured framework for ongoing support and engagement.

Tools like DrFirst's Patient Advisor Report Card are designed to alert healthcare providers about patients who are at risk of non-adherence to their medication therapy. This system provides color-coded alerts within the doctor's e-prescribing workflow, ensuring that providers can address the underlying causes of non-adherence and engage more directly with their patients. Additionally, these tools can include features such as prescription coupons, patient education materials, and wellness program referrals, which help in supporting patients beyond just medication adherence.

Technology also offers solutions like Twistle by Health Catalyst, which delivers timely patient reminders and engagement through text messaging. This platform simplifies patient outreach by reducing the need for follow-up calls and visit scheduling, thereby enhancing patient engagement and reducing the burden on healthcare providers. Automated medication management combined with digital patient engagement tools is effective in reducing physician burnout by simplifies communication tasks and ensuring that patients are more connected to their care.

For patient support, HIPAA-compliant communication tools such as TigerConnect and Updox are important. TigerConnect provides secure messaging for healthcare teams, while Updox offers a comprehensive platform for patient communication and document management. Tools like these ensure that sensitive patient information is protected while enhancing communication and engagement between healthcare providers and patients.

The use of these tools not only offers technical support but also serves as a form of ongoing education and guidance for patients. This can be particularly important for patients with chronic health needs, as it ensures they are well-informated about their treatment and can make more effective use of their healthcare resources. In this way, the process of "edication and support" in patient compliance is not just about technology but also about the human

interaction and understanding that it enables.

Patient education and empowerment are crucial for achieving successful compliance in healthcare. When patients are well-informed about their condition and treatment plan, they can associate their actions with the outcomes of their treatment. This understanding not only enhances their adherence to prescribed medications but also fosters a sense of control and responsibility for their health.

Empowering patients through education equips them with the knowledge needed to make informed decisions about their care. It encourages active participation in shared decision-making processes with healthcare providers, leading to better health outcomes and patient satisfaction. Moreover, educated patients are more likely to follow their treatment plans, reducing the risk of medication errors and adverse reactions. This, in addition to improving adherence, also helps in managing chronic conditions more effectively.

In today's healthcare landscape, technology plays a key role in patient education. Integrating health education apps into patient care plans can enhance engagement and adherence to treatment. By using these tools, healthcare providers can assess patient needs, demonstrate app use, monitor progress, and create a feedback system to ensure that patients are effectively using these resources. This approach not only simplifying complex information but also ensures that patients have ongoing support and resources to reinforce their understanding.

To further improve compliance, strategies such as clear communication, visual aids, and a patient-centered approach are essential. Tailoring education to individual patient needs, including health literacy level and cultural background, ensures that information is understandable and relevant. Regular follow-ups and involving caregivers or family members in the education process can also provide additional support and continuity of care.

In the end, empowering patients through education is not just beneficial for individual health outcomes; it also enhances the overall healthcare system by reducing costs associated with non-adherence and improving the quality of care. By embracing patient-centered care and utilizing effective communication strategies, healthcare providers can empower their patients to take charge of their health journey, leading to better compliance and ultimately, more successful treatment outcomes.

The term "invent and to use tools for KIDs (in this context, patients, especially those with chronic needs or specific health challenges) when it's about patient compliance, we're really

focusing on how technology and innovation can help patients follow their healthcare plans more effectively. This is a critical issue because non-compliance can result in less effective care, more health risks, and even additional healthcare-related challenges.

Incorporating New Tools for Patient Compliance

Technology has become a key tool in healthcare to improve patient compliance. For example, **Automated Medication Refills** and **Patient Communication Tools** are designed to simplify medication management and enhance patient engagement. Tools like Twistle by Health Catalyst use text messages to alert patients about upcoming visits, lab tests, and health maintenance screenings, reducing no-shows and ensuring that patients receive timely care[3]. This not only saves time for healthcare providers but also reduces burnout by automating tasks like reminders and follow-up calls.

Healthcare Compliance Software

Healthcare compliance software is also crucial in managing patient data and ensuring that healthcare providers are following regulations like HIPAA. Software solutions such as MedTrainer and Healthicity help streamline compliance processes, manage risk, and provide training and credentialing support for healthcare staff[1][5]. This not only enhances patient safety by ensuring that sensitive data is properly monitored but also reduces the administrative burden on healthcare providers.

AI and Machine Learning in Healthcare

The integration of Artificial Intelligence (AI) and Machine Learning (ML) in healthcare is also transformative. AI can help in analyzing large data to identify trends and improve patient care. For medical writers, AI tools can assist in automating tasks like writing repetitive text, checking references, and ensuring document consistency, which can improve the efficiency and quality of medical communication[2]. However, there is a need for careful integration to ensure that AI tools are used effectively and that they do not introduce new challenges such as data privacy issues.

The Culture of Compliance

The use of these tools also underscores a growing focus on creating a "solutions-first" environment in healthcare. This environment is driven by a continuous improvement in compliance processes and patient engagement. It's about fostering a system where technology not only simplifies tasks but also enhances patient care by ensuring that all stakeholders are well-informed and involved in the healthcare process.

The Digital Inclusion

Accessibility is also a key issue when it's about using digital tools for patient compliance. Digital solutions must be designed to be accessible to all patients, ensuring that they can use these tools effectively without barriers. This includes making sure that digital platforms are user-friendly and accessible for people with different needs and capabilities[4]. It's about ensuring that the benefits of technology are available to all, which is crucial for equitable healthcare.

The New Front in Patient Care

The future of patient compliance is about harnessing technology to create more effective, accessible, and patient-friendly healthcare systems. It's about using tools that not only simplify healthcare management but also enhance patient outcomes by ensuring that patients are more involved and better supported in their care. This is a continuous process that requires ongoing innovation and collaboration between healthcare providers, technology companies, and patients themselves.

In the realm of orthodontics, patient compliance is crucial for achieving successful treatment outcomes. Incorporating tools that are both appealing and easy to use, especially for children, can significantly enhance their adherence to treatment regimens. One such tool is Invisalign aligners, which have revolutionized the way we approach teeth straightening. These clear aligners are not only virtually invisible but also offer a more comfortable alternative to traditional braces, making them an appealing option for kids.

Invisalign aligners are designed to address a variety of dental issues, including mild to moderate misalignment of teeth, overcrowding, and spacing. They are made from smooth,

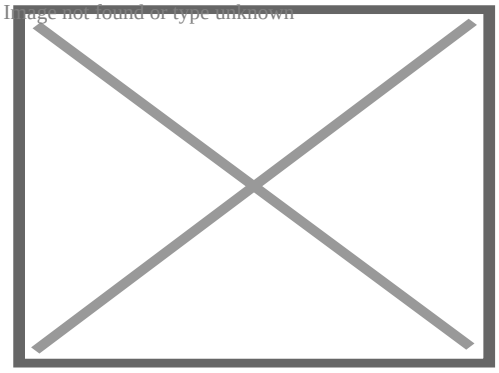
BPA-free plastic, which significantly reduce the risk of discomfort or irritation often associated with traditional braces. The removable feature of Invisalign aligners allows children to maintain good oral hygiene by easily brushing and flossing without any interruptions. This convenience is a key advantage, as it aligns with the needs and expectations of children, who are more likely to comply with a treatment that doesn't significantly impact their daily routines.

Additionally, modern orthodontic solutions are moving beyond just the tools used, to include remote monitoring and virtual check-ins. These advancements enhance convenience by allowing patients to stay connected with their orthodontists without frequent in-person visits. Technologies like DentalMonitoring, which uses AI-powered remote monitoring, provide healthcare professionals with real-time insights into treatment progress. This not only helps in optimizing clinical care but also ensures that patients receive personalized support and reminders, further boosting compliance.

By focusing on patient-centric care, orthodontists can empower children and their parents with comprehensive education about their treatment plan. This includes the expected outcomes, potential challenges, and the importance of compliance. By fostering open communication and using tools that are both appealing and easy to use, orthodontists can create a collaborative treatment approach that aligns with the needs and expectations of young patients, leading to better treatment outcomes and increased patient satisfaction.

About orthodontics

Orthodontics



Connecting the arch-wire on brackets with wire

Occupation	
Names	Orthodontist
Occupation type	Specialty
Activity sectors	Dentistry

Description

Education required	Dental degree, specialty training
Fields of employment	Private practices, hospitals

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

Abnormal alignment of the teeth and jaws is very common. The approximate worldwide prevalence of malocclusion was as high as 56%.[3] However, conclusive scientific evidence for the health benefits of orthodontic treatment is lacking, although patients with completed treatment have reported a higher quality of life than that of untreated patients undergoing orthodontic treatment.[4][5] The main reason for the prevalence of these malocclusions is diets with less fresh fruit and vegetables and overall softer foods in childhood, causing smaller jaws with less room for the teeth to erupt.[6] Treatment may require several months to a few years and entails using dental braces and other appliances to gradually adjust tooth position and jaw alignment. In cases where the malocclusion is severe, jaw surgery may be incorporated into the treatment plan. Treatment usually begins before a person reaches adulthood, insofar as pre-adult bones may be adjusted more easily before adulthood.

History

[edit]

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

Beginning in the mid-1800s, Norman Kingsley published *Oral Deformities*, which is now credited as one of the first works to begin systematically documenting orthodontics. Being a major presence in American dentistry during the latter half of the 19th century, not only was Kingsley one of the early users of extraoral force to correct protruding teeth, but he was also one of the pioneers for treating cleft palates and

associated issues. During the era of orthodontics under Kingsley and his colleagues, the treatment was focused on straightening teeth and creating facial harmony. Ignoring occlusal relationships, it was typical to remove teeth for a variety of dental issues, such as malalignment or overcrowding. The concept of an intact dentition was not widely appreciated in those days, making bite correlations seem irrelevant.[8]

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

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

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

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

In the postwar period, cephalometric radiography[14] started to be used by orthodontists for measuring changes in tooth and jaw position caused by growth and treatment.[15] The x-rays showed that many Class II and III malocclusions were due to improper jaw relations as opposed to misaligned teeth. It became evident that orthodontic therapy could adjust mandibular development, leading to the formation of

functional jaw orthopedics in Europe and extraoral force measures in the US. These days, both functional appliances and extraoral devices are applied around the globe with the aim of amending growth patterns and forms. Consequently, pursuing true, or at least improved, jaw relationships had become the main objective of treatment by the mid-20th century.[8]

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

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

In 1972, Lawrence F. Andrews gave an insightful definition of the ideal occlusion in permanent teeth. This has had meaningful effects on orthodontic treatments that are administered regularly,[16] and these are: 1. Correct interarchal relationships 2. Correct crown angulation (tip) 3. Correct crown inclination (torque) 4. No rotations 5. Tight contact points 6. Flat Curve of Spee (0.0–2.5 mm),[17] and based on these principles, he discovered a treatment system called the straight-wire appliance system, or the pre-adjusted edgewise system. Introduced in 1976, Larry Andrews' pre-adjusted edgewise appliance, more commonly known as the straight wire appliance, has since revolutionized fixed orthodontic treatment. The advantage of the design lies in its bracket and archwire combination, which requires only minimal wire bending from the orthodontist or clinician. It's aptly named after this feature: the angle of the slot and thickness of the bracket base ultimately determine where each tooth is situated with little need for extra manipulation.[18][19][20]

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

Evolution of the current orthodontic appliances

[edit]

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

Fixed appliances

[edit]

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

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

E-arch

[edit]

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

Pin and tube appliance

[edit]

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

Ribbon arch

[edit]

Realizing that the pin and tube appliance was not easy to control, Angle developed a better option, the ribbon arch, which was much simpler to use. Most of its components were already prepared by the manufacturer, so it was significantly easier to manage than before. In order to attach the ribbon arch, the occlusal area of the bracket was opened. Brackets were only added to eight incisors and mandibular canines, as it would be impossible to insert the arch into both horizontal molar tubes and the vertical brackets of adjacent premolars. This lack of understanding posed a considerable challenge to dental professionals; they were unable to make corrections to an excessive Spee curve in bicuspid teeth.[24] Despite the complexity of the situation, it was necessary for practitioners to find a resolution. Unparalleled to its counterparts, what made the ribbon arch instantly popular was that its archwire had remarkable spring qualities and could be utilized to accurately align teeth that were misaligned. However, a major drawback of this device was its inability to effectively control root position since it did not have enough resilience to generate the torque movements required for setting roots in their new place.[8]

Edgewise appliance

[edit]

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

Labiolingual

[edit]

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

Twin wire

[edit]

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

Begg's Appliance

[edit]

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

anchorage control, which lessened contact angles between wires and corners of the bracket.

Tip-Edge System

[edit]

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

Contemporary edgewise systems

[edit]

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

Automatic rotational control

[edit]

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

Alteration in bracket slot dimensions

[edit]

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

Straight-wire bracket prescriptions

[edit]

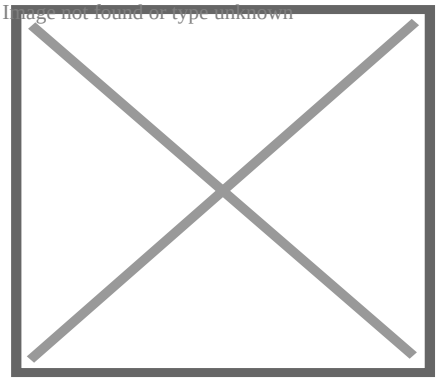
Rather than rely on the same bracket for all teeth, L.F. Andrews found a way to make different brackets for each tooth in the 1980s, thanks to the increased convenience of bonding.[28] This adjustment enabled him to avoid having multiple bends in archwires that would have been needed to make up for variations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

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

bends would still be required on each patient's archwire.

Methods

[edit]



Upper and lower jaw functional expanders

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

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

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

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

Braces

[edit]

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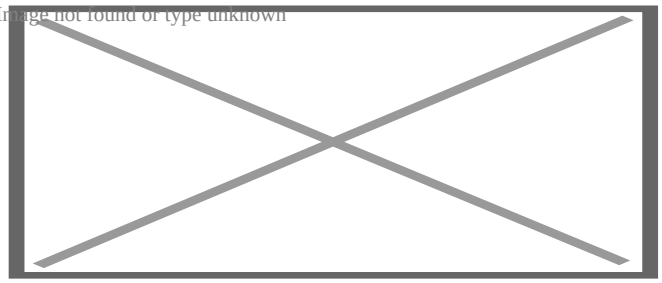


Dental braces

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

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

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

Treatment duration

[edit]

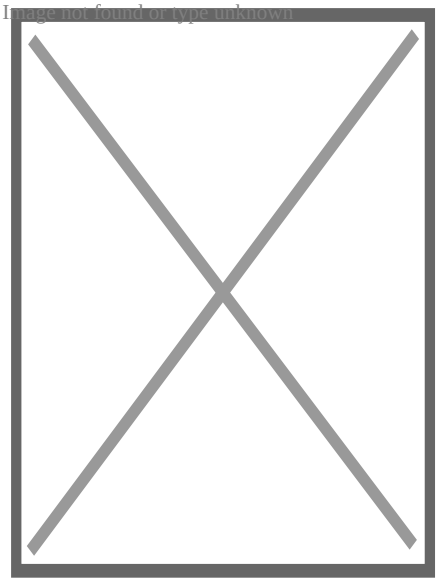
The time required for braces varies from person to person as it depends on the severity of the problem, the amount of room available, the distance the teeth must travel, the health of the teeth, gums, and supporting bone, and how closely the patient follows instructions. On average, however, once the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

many years.[39]

Headgear

[edit]

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



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

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

Palatal expansion

[edit]

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

Jaw surgery

[edit]

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

During treatment

[edit]

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

Post treatment

[edit]

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

Removable retainers

[edit]

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

Fixed retainers

[edit]

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

Palatal expander

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Palatal expander

Orthodontic headgear

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Orthodontic headgear
An X-ray taken for skull analysis

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

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Top (left) and bottom retainers

Clear aligners

[edit]

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

Training

[edit]

There are several specialty areas in dentistry, but the specialty of orthodontics was the first to be recognized within dentistry.[50] Specifically, the American Dental Association recognized orthodontics as a specialty in the 1950s.[50] Each country has its own system for training and registering orthodontic specialists.

Australia

[edit]

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

Bangladesh

[edit]

Dhaka Dental College in Bangladesh is one of the many schools recognized by the Bangladesh Medical and Dental Council (BM&DC) that offer post-graduation orthodontic courses.[55][56] Before applying to any post-graduation training courses, an applicant must have completed the Bachelor of Dental Surgery (BDS) examination

from any dental college.[55] After application, the applicant must take an admissions test held by the specific college.[55] If successful, selected candidates undergo training for six months.[57]

Canada

[edit]

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

United States

[edit]

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

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

United Kingdom

[edit]

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

See also

[edit]

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

Notes

[edit]

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

References

[edit]

1. **^** *"Definition of orthodontics | Dictionary.com". www.dictionary.com. Retrieved 2019-08-28.*
2. **^** *"What is orthodontics?// Useful Resources: FAQ and Downloadable eBooks". Orthodontics Australia. Retrieved 2020-08-13.*
3. **^** *Lombardo G, Vena F, Negri P, Pagano S, Barilotti C, Paglia L, Colombo S, Orso M, Cianetti S (June 2020). "Worldwide prevalence of malocclusion in the different stages of dentition: A systematic review and meta-analysis". Eur J Paediatr Dent.* ***21*** *(2): 115–22. doi:10.23804/ejpd.2020.21.02.05. PMID 32567942.*
4. **^** *Whitcomb I (2020-07-20). "Evidence and Orthodontics: Does Your Child Really Need Braces?". Undark Magazine. Retrieved 2020-07-27.*
5. **^** *"Controversial report finds no proof that dental braces work". British Dental Journal.* ***226*** *(2): 91. 2019-01-01. doi:10.1038/sj.bdj.2019.65. ISSN 1476-5373. S2CID 59222957.*
6. **^** *von Cramon-Taubadel N (December 2011). "Global human mandibular variation reflects differences in agricultural and hunter-gatherer subsistence strategies". Proceedings of the National Academy of Sciences of the United States of America.* ***108*** *(49): 19546–19551. Bibcode:2011PNAS..10819546V. doi: 10.1073/pnas.1113050108. PMC 3241821. PMID 22106280.*
7. **^** *Rose, Jerome C.; Roblee, Richard D. (June 2009). "Origins of dental crowding and malocclusions: an anthropological perspective". Compendium of Continuing Education in Dentistry (Jamesburg, N.J.: 1995).* ***30*** *(5): 292–300. ISSN 1548-8578. PMID 19514263.*
8. ^ ***a b c d e f g h i j k*** *Proffit WR, Fields Jr HW, Larson BE, Sarver DM (2019). Contemporary orthodontics (Sixth ed.). Philadelphia, PA. ISBN 978-0-323-54387-3. OCLC 1089435881.*cite book: CS1 maint: location missing publisher (link)
9. ^ ***a b c d e*** *"A Brief History of Orthodontic Braces – ArchWired". www.archwired.com. 17 July 2019.*[*self-published source*]
10. **^** *Peck S (November 2009). "A biographical portrait of Edward Hartley Angle, the first specialist in orthodontics, part 1". The Angle Orthodontist.* ***79*** *(6): 1021–1027. doi:10.2319/021009-93.1. PMID 19852589.*
11. **^** *"The Application of the Principles of the Edge- wise Arch in the Treatment of Malocclusions: II.*". meridian.allenpress.com. Retrieved 2023-02-07.*
12. **^** *"British Orthodontic Society > Museum and Archive > Collection > Fixed Appliances > Begg". www.bos.org.uk. Retrieved 2023-02-07.*
13. **^** *Safirstein D (August 2015). "P. Raymond Begg". American Journal of Orthodontics and Dentofacial Orthopedics.* ***148*** *(2): 206. doi:10.1016/j.ajodo.2015.06.005. PMID 26232825.*
14. **^** *Higley LB (August 1940). "Lateral head roentgenograms and their relation to the orthodontic problem". American Journal of Orthodontics and Oral Surgery.* ***26*** *(8): 768–778. doi:10.1016/S0096-6347(40)90331-3. ISSN 0096-6347.*
15. **^** *Themes UF (2015-01-12). "14: Cephalometric radiography". Pocket Dentistry. Retrieved 2023-02-07.*

16. ^ ***a b*** *Andrews LF (December 2015). "The 6-elements orthodontic philosophy: Treatment goals, classification, and rules for treating". American Journal of Orthodontics and Dentofacial Orthopedics. **148** (6): 883–887. doi: 10.1016/j.ajodo.2015.09.011. PMID 26672688.*
17. ***^*** *Andrews LF (September 1972). "The six keys to normal occlusion". American Journal of Orthodontics. **62** (3): 296–309. doi:10.1016/s0002-9416(72)90268-0. PMID 4505873. S2CID 8039883.*
18. ^ ***a b*** *Themes UF (2015-01-01). "31 The straight wire appliance". Pocket Dentistry. Retrieved 2023-02-07.*
19. ***^*** *Andrews LF (July 1979). "The straight-wire appliance". British Journal of Orthodontics. **6** (3): 125–143. doi:10.1179/bjo.6.3.125. PMID 297458. S2CID 33259729.*
20. ***^*** *Phulari B (2013), "Andrews' Straight Wire Appliance", History of Orthodontics, Jaypee Brothers Medical Publishers (P) Ltd., p. 98, doi:10.5005/jp/books/12065_11, ISBN 9789350904718, retrieved 2023-02-07*
21. ***^*** Angle EH. Treatment of malocclusion of the teeth. 7th éd. Philadelphia: S.S.White Dental Mfg Cy, 1907
22. ***^*** *Philippe J (March 2008). "How, why, and when was the edgewise appliance born?". Journal of Dentofacial Anomalies and Orthodontics. **11** (1): 68–74. doi: 10.1051/odfen/20084210113. ISSN 2110-5715.*
23. ***^*** *Angle EH (1912). "Evolution of orthodontia. Recent developments". Dental Cosmos. **54**: 853–867.*
24. ***^*** *Brodie AG (1931). "A discussion on the Newest Angle Mechanism". The Angle Orthodontist. **1**: 32–38.*
25. ***^*** *Angle EH (1928). "The latest and best in Orthodontic Mechanism". Dental Cosmos. **70**: 1143–1156.*
26. ***^*** *Brodie AG (1956). "Orthodontic Concepts Prior to the Death of Edward Angle". The Angle Orthodontist. **26**: 144–155.*
27. ***^*** *Matasa CG, Graber TM (April 2000). "Angle, the innovator, mechanical genius, and clinician". American Journal of Orthodontics and Dentofacial Orthopedics. **117** (4): 444–452. doi:10.1016/S0889-5406(00)70164-8. PMID 10756270.*
28. ***^*** Andrews LF. Straight Wire: The Concept and Appliance. San Diego: LA Wells; 1989.
29. ***^*** *Andrews LF (1989). Straight wire: the concept and appliance. Lisa Schirmer. San Diego, CA. ISBN 978-0-9616256-0-3. OCLC 22808470.*cite book: CS1 maint: location missing publisher (link)
30. ***^*** *Roth RH (November 1976). "Five year clinical evaluation of the Andrews straight-wire appliance". Journal of Clinical Orthodontics. **10** (11): 836–50. PMID 1069735.*
31. ***^*** *Fleming PS, Fedorowicz Z, Johal A, El-Angbawi A, Pandis N, et al. (The Cochrane Collaboration) (June 2015). "Surgical adjunctive procedures for accelerating orthodontic treatment". The Cochrane Database of Systematic Reviews. **2015** (6). John Wiley & Sons, Ltd.: CD010572.*

doi:10.1002/14651858.cd010572. PMC 6464946. PMID 26123284.

32. **^** *"What is an Orthodontist?". Orthodontics Australia. 5 December 2019.*
33. **^** *Dardengo C, Fernandes LQ, Capelli Júnior J (February 2016). "Frequency of orthodontic extraction". Dental Press Journal of Orthodontics. **21** (1): 54–59. doi:10.1590/2177-6709.21.1.054-059.oar. PMC 4816586. PMID 27007762.*
34. **^** *"Child Dental Health Survey 2013, England, Wales and Northern Ireland". digital.nhs.uk. Retrieved 2018-03-08.*
35. **^** *Atsawasuwan P, Shirazi S (2019-04-10). "Advances in Orthodontic Tooth Movement: Gene Therapy and Molecular Biology Aspect". In Aslan BI, Uzuner FD (eds.). Current Approaches in Orthodontics. IntechOpen. doi: 10.5772/intechopen.80287. ISBN 978-1-78985-181-6. Retrieved 2021-05-16.*
36. ^ ***a b*** *"Elastics For Braces: Rubber Bands in Orthodontics". Orthodontics Australia . 2019-12-15. Retrieved 2020-12-13.*
37. **^** *Mitchell L (2013). An Introduction to Orthodontics. Oxford Medical Publications. pp. 220–233.*
38. **^** *Rossini G, Parrini S, Castroflorio T, Deregibus A, Debernardi CL (September 2015). "Efficacy of clear aligners in controlling orthodontic tooth movement: a systematic review". The Angle Orthodontist. **85** (5): 881–889. doi: 10.2319/061614-436.1. PMC 8610387. PMID 25412265. S2CID 10787375. "The quality level of the studies was not sufficient to draw any evidence-based conclusions."*
39. **^** *"Dental Braces and Retainers".*
40. **^** *Millett DT, Cunningham SJ, O'Brien KD, Benson PE, de Oliveira CM (February 2018). "Orthodontic treatment for deep bite and retroclined upper front teeth in children". The Cochrane Database of Systematic Reviews. **2** (2): CD005972. doi:10.1002/14651858.CD005972.pub4. PMC 6491166. PMID 29390172.*
41. **^** *"Palate Expander". Cleveland Clinic. Retrieved October 29, 2024.*
42. **^** *"Jaw Surgery". Modern Orthodontic Clinic in Sammamish & Bellevue. Retrieved 2024-10-03.*
43. **^** *Agnihotry A, Fedorowicz Z, Nasser M, Gill KS, et al. (The Cochrane Collaboration) (October 2017). Zbigniew F (ed.). "Resorbable versus titanium plates for orthognathic surgery". The Cochrane Database of Systematic Reviews. **10** (10). John Wiley & Sons, Ltd: CD006204. doi:10.1002/14651858.cd006204. PMC 6485457. PMID 28977689.*
44. **^** *"British Orthodontic Society > Public & Patients > Your Jaw Surgery". www.bos.org.uk. Retrieved 2019-08-28.*
45. **^** *Fleming PS, Strydom H, Katsaros C, MacDonald L, Curatolo M, Fudalej P, Pandis N, et al. (Cochrane Oral Health Group) (December 2016). "Non-pharmacological interventions for alleviating pain during orthodontic treatment". The Cochrane Database of Systematic Reviews. **2016** (12): CD010263. doi:10.1002/14651858.CD010263.pub2. PMC 6463902. PMID 28009052.*
46. **^** *Yu Y, Sun J, Lai W, Wu T, Koshy S, Shi Z (September 2013). "Interventions for managing relapse of the lower front teeth after orthodontic treatment". The*

Cochrane Database of Systematic Reviews. ***2014*** *(9): CD008734. doi:10.1002/14651858.CD008734.pub2. PMC 10793711. PMID 24014170.*
47. **^** *"Clear Retainers | Maintain Your Hard to Get Smile with Clear Retainers". Retrieved 2020-01-13.*
48. ^ ***a b*** *Martin C, Littlewood SJ, Millett DT, Doubleday B, Bearn D, Worthington HV, Limones A (May 2023). "Retention procedures for stabilising tooth position after treatment with orthodontic braces". The Cochrane Database of Systematic Reviews.* ***2023*** *(5): CD002283. doi:10.1002/14651858.CD002283.pub5. PMC 10202160. PMID 37219527.*
49. **^** *Putrino A, Barbato E, Galluccio G (March 2021). "Clear Aligners: Between Evolution and Efficiency-A Scoping Review". International Journal of Environmental Research and Public Health*. ***18*** *(6): 2870. doi: 10.3390/ijerph18062870. PMC 7998651. PMID 33799682.*
50. ^ ***a b*** *Christensen GJ (March 2002). "Orthodontics and the general practitioner". Journal of the American Dental Association*. ***133*** *(3): 369–371. doi:10.14219/jada.archive.2002.0178. PMID 11934193.*
51. **^** *"How to become an orthodontist". Orthodontics Australia. 26 September 2017.*
52. **^** *"Studying orthodontics". Australian Society of Orthodontists. 26 September 2017.*
53. **^** *"Specialties and Specialty Fields". Australian Health Practitioners Regulation Agency.*
54. **^** *"Medical Specialties and Specialty Fields". Medical Board of Australia.*
55. ^ ***a b c*** *"Dhaka Dental College". Dhaka Dental College. Archived from the original on October 28, 2017. Retrieved October 28, 2017.*
56. **^** *"List of recognized medical and dental colleges". Bangladesh Medical & Dental Council (BM&DC). Retrieved October 28, 2017.*
57. **^** *"Orthodontic Facts - Canadian Association of Orthodontists". Canadian Association of Orthodontists. Retrieved 26 October 2017.*
58. ^ ***a b c*** *"FAQ: I Want To Be An Orthodontist - Canadian Association of Orthodontists". Canadian Association of Orthodontists. Retrieved 26 October 2017.*
59. **^** *"RCDC - Eligibility". The Royal College of Dentists of Canada. Archived from the original on 29 October 2019. Retrieved 26 October 2017.*
60. **^** *"Accredited Orthodontic Programs - AAO Members". www.aaoinfo.org.*
61. ^ ***a b c d e f*** *"About Board Certification". American Board of Orthodontists. Archived from the original on 16 February 2019. Retrieved 26 October 2017.*
62. **^** *"Accredited Orthodontic Programs | AAO Members". American Association of Orthodontists. Retrieved 26 October 2017.*
63. ^ ***a b c d e f*** *"Orthodontic Specialty Training in the UK" (PDF). British Orthodontic Society. Retrieved 28 October 2017.*

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Orthodontics

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

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

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

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

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Dentistry

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

Dental surgery	○ Dental extraction ○ Tooth filling ○ Root canal therapy ○ Root end surgery ○ Scaling and root planing ○ Teeth cleaning ○ Dental bonding ○ Tooth polishing ○ Tooth bleaching ○ Socket preservation ○ Dental implant
Organisations	○ American Association of Orthodontists ○ British Dental Association ○ British Dental Health Foundation ○ British Orthodontic Society ○ Canadian Association of Orthodontists ○ Dental Technologists Association ○ General Dental Council ○ Indian Dental Association ○ National Health Service
By country	○ Canada ○ Philippines ○ Israel ○ United Kingdom ○ United States
See also	○ Index of oral health and dental articles ○ Outline of dentistry and oral health ○ Dental fear ○ Dental instruments ○ Dental material ○ History of dental treatments ○ Ancient Rome ○ Infant oral mutilation ○ Mouth assessment ○ Oral hygiene

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Cleft lip and cleft palate

Related specialities	○ Advance practice nursing ○ Audiology ○ Dentistry ○ Dietetics ○ Genetics ○ Oral and maxillofacial surgery ○ Orthodontics ○ Orthodontic technology ○ Otolaryngology ○ Pediatrics ○ Pediatric dentistry ○ Physician ○ Plastic surgery ○ Psychiatry ○ Psychology ○ Respiratory therapy ○ Social work ○ Speech and language therapy
Related syndromes	○ Hearing loss with craniofacial syndromes ○ Pierre Robin syndrome ○ Popliteal pterygium syndrome ○ Van der Woude syndrome
National and international organisations	○ Cleft Lip and Palate Association ○ Craniofacial Society of Great Britain and Ireland ○ Interplast ○ North Thames Regional Cleft Lip and Palate Service ○ Operation Smile ○ Overseas Plastic Surgery Appeal ○ Shriners Hospitals for Children ○ Smile Train ○ Transforming Faces Worldwide ○ Smile Angel Foundation (China)
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- **Managing Expectations During Corrective Jaw Treatment**

IQDENT - Ortodontska Klinika

Phone : +385953817015

City : Zagreb

State : Hrvatska

Zip : 10000

Address : IQDENT - Ortodontska Klinika

Company Website : **https://iqdent.hr/**