

- **Linking Orthodontics with Periodontal Health**
Linking Orthodontics with Periodontal Health Coordinating with Oral Surgeons for Jaw Corrections Integrating Pediatric Dentistry for Early Intervention Combining Endodontic Care in Complex Cases Collaborative Planning with Prosthodontists Sharing Diagnostic Data Across Multiple Specialists Addressing Aesthetic and Functional Goals Together Communication Strategies Among Dental Teams Balancing Orthodontic Solutions and Restorative Needs Encouraging Holistic Treatment Approaches Managing Patients with Special Medical Conditions Efficient Referrals That Improve Patient Outcomes
- **AI Driven Aligners That Predict Movement**
AI Driven Aligners That Predict Movement Cloud Based Case Tracking for Efficient Management Digital Impressions That Replace Traditional Molds Virtual Consultations for Remote Care 3D Printing Applications in Orthodontic Appliances Teledentistry and Its Impact on Patient Convenience Software Innovations for Treatment Simulations Aligning Treatment Goals with Technological Advances Advantages of Using Digital Models in Planning Modern Approaches to Virtual Monitoring Reducing Errors Through Computerized Analysis The Future of Orthodontics in a Digital Era
- **About Us**



Okay, so picture this: you're a kid, maybe eight years old, sitting in a big, scary chair, and someone's about to stick metal bits in your mouth. Not exactly a picnic, right? That's why, in pediatric orthodontics, effective communication isn't just a nice-to-have, it's absolutely critical. It's the difference between a cooperative patient and a terrified, kicking, screaming one.

Think about it from the dental team's perspective too. The orthodontist needs to clearly explain the treatment plan to the parents, ensuring they understand the process, the timeline, and the cost. Misunderstandings here can lead to frustration and distrust down the line. Braces work by gently applying pressure to move teeth into place Kids' dental alignment services jaw. Then, the dental assistant needs to be able to connect with the child, build rapport, and explain the steps of the procedure in a way that's age-appropriate and reassuring. Using kid-friendly language, showing empathy, and even a little humor can go a long way.

It's not just about talking *at* people, though. It's about active listening. Paying attention to the child's fears and concerns, acknowledging their feelings, and answering their questions honestly (without overwhelming them with technical jargon) is vital. The same goes for parents; understanding their expectations and addressing their anxieties is key to building a strong, collaborative relationship.

Ultimately, effective communication in a pediatric orthodontic setting fosters trust, reduces anxiety, and leads to better treatment outcomes. It creates a positive and supportive environment where both children and their parents feel heard, understood, and confident in the care they're receiving. And honestly, isn't that what we all want when we're sitting in that big, scary chair?

Dental teams, brimming with expertise and compassion, walk a tightrope. They need to deliver vital information, often about procedures that can seem scary, to a diverse audience. And when that audience includes children, the tightrope gets a whole lot bouncier. Tailoring communication to different age groups isn't just a nice-to-have; it's fundamental to building trust, reducing anxiety, and ultimately ensuring a successful dental experience.

Think about it: a five-year-old's world is vastly different from a pre-teen's. Explaining a filling to a kindergartener using technical jargon is a recipe for wide-eyed panic. Instead, you might describe it as "putting a little band-aid on your tooth to make it strong again." Use playful language, focus on the positive outcome (a healthy, happy smile), and maybe even incorporate a stuffed animal "patient" for a quick demonstration.

On the other hand, an eleven-year-old might appreciate a more straightforward, albeit still gentle, explanation. They're developing a sense of autonomy and understanding, so involving them in the

process is key. Show them the tools, explain what they do in simple terms (avoiding overly frightening descriptions), and answer their questions honestly. Letting them choose a flavor of fluoride or pick a song to listen to during the procedure can empower them and reduce feelings of helplessness.

The key is empathy. Put yourself in their tiny shoes (or slightly larger sneakers). What would *you* want to know if you were in their position? What would make you feel safe and understood? By adapting your language, your tone, and your approach to suit each child's developmental stage, dental teams can transform a potentially stressful encounter into a positive learning experience. And that's a win for everyone, from the youngest patient to the most seasoned dentist.

*** Preventive measures to maintain periodontal health during orthodontic treatment.**

Navigating the world of dental care for your child can feel overwhelming, especially when treatment plans come into the picture. As dental professionals, we understand this, and clear communication with you, the parents, is absolutely paramount. It's not just about rattling off terms like 'occlusal sealant' or 'pulpotomy'; it's about making sure you truly understand what we're recommending, why we're recommending it, and how it will benefit your child's long-term oral health.

One key strategy is avoiding jargon whenever possible. Instead of saying "We need to address the distobuccal cusp fracture," we might say, "There's a small crack on the back side of one of your child's molars that we need to repair." Simple, direct language makes a world of difference. Visual aids are also incredibly helpful. Showing you an X-ray and pointing out the area of concern, or using models to demonstrate a procedure, can solidify your understanding in a way words sometimes can't.

Beyond the technical aspects, it's crucial to address your concerns and answer your questions patiently and thoroughly. We need to actively listen to what you're saying, acknowledge your anxieties, and provide reassurance. This often involves explaining the potential consequences of *not* treating the issue, as well as the benefits of the proposed treatment. We want you to feel empowered to make informed decisions about your child's care.

Finally, it's about creating a trusting relationship. This means being approachable, empathetic, and willing to go the extra mile to ensure you feel comfortable. It's not just a one-time conversation; it's an ongoing dialogue. Follow-up calls, written summaries, and opportunities for further discussion are all valuable tools in building that trust and ensuring everyone is on the same page when it comes to your child's dental health. Ultimately, we're partners in this, working together to ensure your child has a healthy and happy smile.

*** The role of oral hygiene instructions for children and parental involvement.**

Okay, so we're talking about dental teams, right? And how they communicate. One thing that's super helpful – and sometimes overlooked – is using good old visual aids and keeping the language simple when explaining procedures.

Think about it. You're a patient, maybe a little nervous already. The dentist starts throwing around terms like "distal marginal ridge" and "buccal cusp." Your eyes glaze over. But if they pulled out a diagram, pointed to the tooth, and said, "See this part here? We're going to gently smooth it down," suddenly it makes sense. Visuals are powerful. They bypass the jargon and give you a clear picture of what's happening.

And it's not just for patients! Even within the team, simplified language and visuals can prevent misunderstandings. Imagine a dental assistant prepping for a complicated root canal. Instead of just hearing "prepare the irrigation solution," a quick reference card with the exact measurements and steps, maybe even a photo of the setup, can significantly reduce errors and boost confidence.

The point is, clear communication isn't about sounding smart; it's about being understood. Visual aids and simplified language are tools that help bridge the gap between dental professionals and patients, and even improve communication between team members. It leads to a smoother, less stressful experience for everyone involved.

*** Early detection and management of periodontal problems during orthodontic care.**

Okay, so let's talk about the little ones. Kids in the dental chair? That's a whole different ballgame. It's not just about checking teeth; it's about navigating a minefield of anxieties and, sometimes, outright terror. Think about it: strange sounds, weird smells, someone poking around in their mouth with shiny metal things...it's a recipe for a mini-meltdown.

That's where communication becomes absolutely crucial for the dental team. It's not enough to just say "open wide." We're talking about building trust, speaking their language (which is definitely not dental jargon), and validating their feelings. If a kid says they're scared, don't brush it off. Acknowledge it! "I understand you're feeling a little nervous, that's totally okay. How about we count your teeth together?"

Distraction is your friend. Tell a story, let them hold a toy, or even just focus on their breathing. Show them the tools beforehand and explain what they do in simple terms. "This little guy just blows air to dry your tooth, like a tiny hairdryer." Make it less scary, more relatable.

And remember, patience is key. Sometimes, you have to adjust your plan. If a child is really struggling, maybe you just do a quick check and reschedule for another day. Forcing the issue can create a negative association with the dentist that lasts a lifetime. Ultimately, addressing and alleviating children's anxieties isn't just about getting the job done; it's about creating a positive experience that sets them up for a lifetime of good oral health. It's about being human, being understanding, and being a calming presence in what can be a very overwhelming situation.

*** Collaboration between orthodontists and periodontists for optimal outcomes.**

Okay, so let's talk about how much we actually *say* without saying a word, especially when we're all crammed together in an orthodontic office, right? You've got the orthodontist, the assistants, the hygienists, the front desk crew – it's a whole team effort. And while we spend a lot of time talking to patients about elastics and brackets and treatment plans, a huge chunk of how we function as a unit relies on nonverbal communication.

Think about it. The orthodontist is mid-procedure, hands deep in a patient's mouth. They might just raise an eyebrow to signal an assistant to pass them a specific instrument. No need to shout over the suction! A quick nod of the head can confirm that the assistant understood perfectly. That's efficiency, right there. And it avoids interrupting the flow of the appointment for the patient.

Beyond efficiency, nonverbal cues build trust and create a positive environment. A genuine smile from the front desk staff sets the tone for the whole visit. A reassuring pat on the shoulder from an assistant can calm a nervous patient. Even eye contact – making sure everyone feels seen and heard – contributes to a sense of teamwork and respect.

But here's the thing: misinterpreting nonverbal cues can lead to misunderstandings and stress. Maybe someone's looking down because they're concentrating, but another team member interprets it as disinterest or disapproval. That's where being aware of your own body language and actively trying to understand others comes in. It's about being mindful of your facial expressions, your posture, and your tone of voice, even when you're not actually saying anything.

So, the role of nonverbal communication in an orthodontic team? It's huge. It's about streamlining procedures, building rapport, and fostering a positive, productive work environment. It's about understanding that sometimes, what you *don't* say speaks volumes. And when the whole team is on the same nonverbal wavelength, that's when the real orthodontic magic happens.

Okay, so let's talk about how dental teams actually *get along* and make decisions together, especially when things get a little... heated. Because let's be real, in the fast-paced environment of a dental office, disagreements are bound to happen. We're talking about different personalities, varying levels of experience, and the pressure of patient care all colliding.

Conflict resolution and collaborative decision-making aren't just fancy buzzwords; they're the glue that holds a high-functioning dental team together. When disagreements arise, sweeping them under the rug doesn't work. Instead, open and honest communication is key. Think about it: is the hygienist concerned about a patient's periodontal health and wants to spend more time on scaling? Maybe the dentist feels booked solid and that's a problem. Instead of a passive-aggressive snipe, a direct, respectful conversation about patient needs and scheduling realities can lead to a solution that benefits everyone.

Collaborative decision-making means everyone at the table feels heard. It's not about one person's opinion trumping all others, but about acknowledging each team member's expertise. A dental assistant might have valuable insights into the efficiency of a procedure, while the receptionist might have a better understanding of patient anxieties. When everyone contributes, the final decision is usually stronger and better-informed.

Ultimately, healthy conflict resolution and collaborative decision-making boil down to respect. Respect for each other's roles, respect for each other's opinions, and respect for the shared goal of providing the best possible patient care. When that respect is present, even the stickiest situations can be navigated with grace and a focus on finding solutions that work for the entire team. And that, in turn, creates a more positive and productive environment for everyone, including the patients.

Communication in a dental team is like the gears in a fine watch – if one isn't meshing right, the whole thing slows down, or worse, breaks. And in today's world, we can't just rely on yelling down the hallway or scribbled notes. We've got to talk about leveraging technology to make sure everyone is on the same page and, crucially, that our patients feel heard and understood.

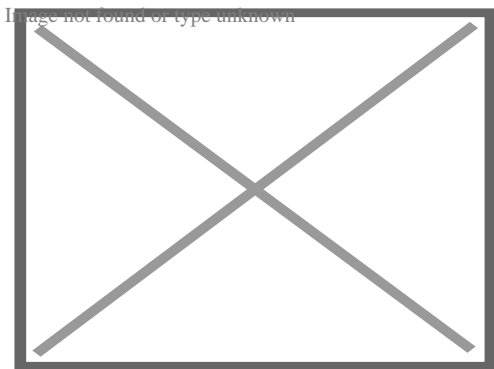
Think about it. A quick text message reminding a patient about an appointment drastically cuts down on no-shows. A secure online portal where patients can view their treatment plans, ask questions, and share their concerns empowers them to be active participants in their care. And internal communication tools – instant messaging, shared calendars, project management software – they can streamline the entire workflow, ensuring everything from ordering supplies to scheduling complex procedures goes smoothly.

It's not just about being efficient, though. Using technology thoughtfully can actually build stronger relationships. A personalized email following up after a procedure shows you care. A video explaining a complex treatment in simple terms can ease anxiety. These things demonstrate that you're not just seeing teeth, you're seeing a person.

Of course, there's a balance. We don't want to hide behind screens. A genuine smile and a listening ear are still vital. But by thoughtfully integrating technology into our communication strategies, we can create a more efficient, more engaged, and ultimately, more human experience for our patients and our team. It's about using these tools to enhance, not replace, the personal touch that makes a great dental practice.

About orthodontics

Orthodontics



Connecting the arch-wire on brackets with wire

Names **Occupation**
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

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

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

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

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

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

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

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

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

Consequently, pursuing true, or at least improved, jaw relationships had become the main objective of treatment by the mid-20th century.^[8]

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

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

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

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

Evolution of the current orthodontic appliances

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

Fixed appliances

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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 rectangular 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

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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

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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

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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

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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

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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]

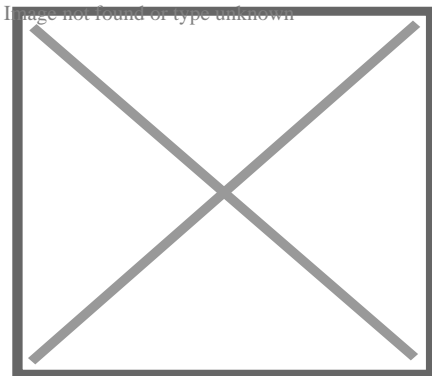
Rather than rely on the same bracket for all teeth, L.F. Andrews found a way to make different brackets for each tooth in the 1980s, thanks to the increased convenience of bonding.^[28] This adjustment enabled him to avoid having multiple bends in archwires that would have been needed to make up for 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 rectangular archwire can be contorted to form a custom fit without inadvertently shifting any correctly positioned teeth. Without bracket angulation and torque, second-order or tip bends would still be required on each patient's archwire.

Methods

[edit]



Upper and lower jaw functional expanders

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

Orthodontic therapy may include the use of fixed or removable appliances. Most orthodontic therapy is delivered using appliances that are fixed in place,^[34] for example, braces that are

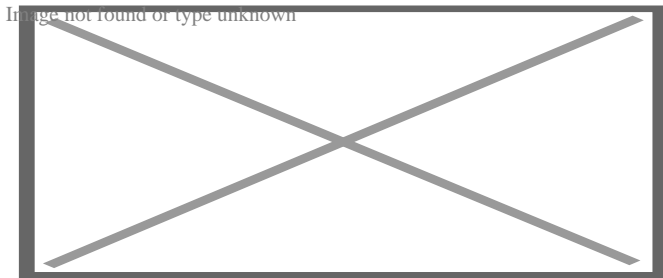
adhesively bonded to the teeth. Fixed appliances may provide greater mechanical control of the teeth; optimal treatment outcomes are improved by using fixed appliances.

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

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

Braces

[edit]



Dental braces

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

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

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

Treatment duration

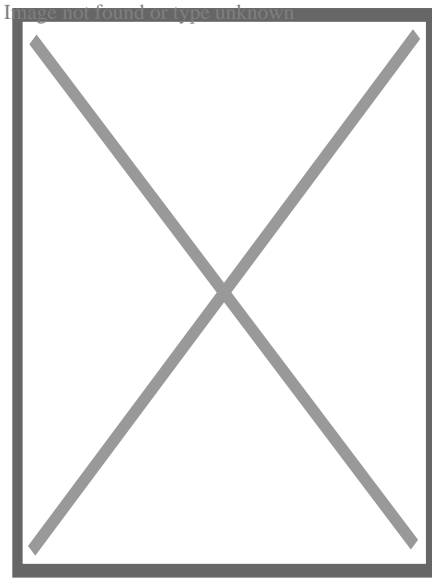
[edit]

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

Headgear

[edit]

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



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

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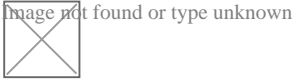
1. ^ "Definition of orthodontics | Dictionary.com". *www.dictionary.com*. Retrieved 2019-08-28.
2. ^ "What is orthodontics?// Useful Resources: FAQ and Downloadable eBooks". *Orthodontics Australia*. Retrieved 2020-08-13.
3. ^ Lombardo G, Vena F, Negri P, Pagano S, Barilotti C, Paglia L, Colombo S, Orso 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.

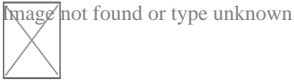
29. ^ Andrews LF (1989). *Straight wire: the concept and appliance*. Lisa Schirmer. San Diego, CA. ISBN 978-0-9616256-0-3. OCLC 22808470.cite book: CS1 maint: location missing publisher (link)
30. ^ Roth RH (November 1976). "Five year clinical evaluation of the Andrews straight-wire appliance". *Journal 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. ^ Atsawasuwana 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
- Temporomandibular 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

- Edward Angle
- Spencer Atkinson
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- 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)

- Germany
- United States
- Czech Republic
- Israel

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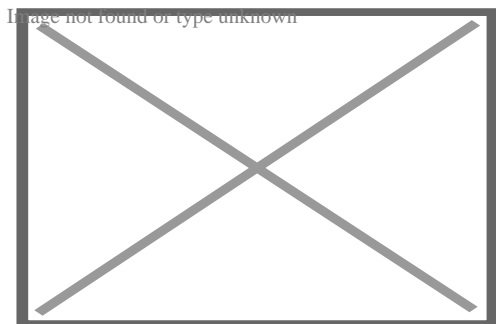
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About pediatrics

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

Pediatrics



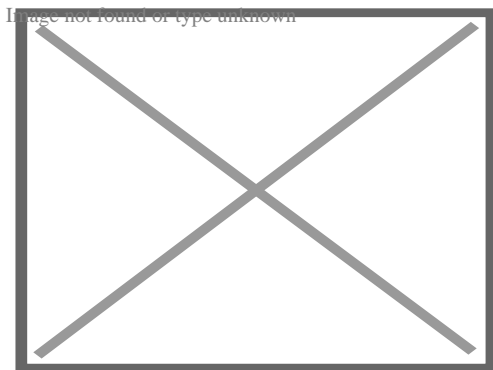
A pediatrician examines a neonate.

Focus	Infants, Children, Adolescents, and Young Adults
Subdivisions	<i>Paediatric cardiology, neonatology, critical care, pediatric oncology, hospital medicine, primary care, others (see below)</i>
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: *pais* "child") and *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

[edit]



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* (crèches).^[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

[edit]

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 Wrocław) 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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

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

[edit]

The examples and perspective in this section **deal primarily with United States and Globe** **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. (Image not found *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]

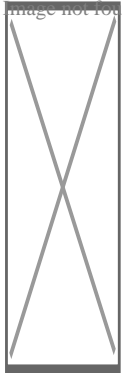
In high school, future pediatricians are required to take basic science classes such as biology, chemistry, physics, algebra, geometry, and calculus. It is also advisable to learn a foreign language (preferably Spanish in the United States) and be involved in high school organizations and extracurricular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

[edit]

Pediatrics

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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

[edit]

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]

- [^] "Paediatrics" (PDF). *nhs.uk*. Archived (PDF) from the original on 13 July 2020. Retrieved 2 July 2020.
- [^] "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.
- [^] "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.
- [^] 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.
- [^] **a b c d e** Duffin, Jacalyn (2010). *History of Medicine, Second Edition: A Scandalously Short Introduction*. University of Toronto Press.
- [^] **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.
- [^] 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 Pediatría*. **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.

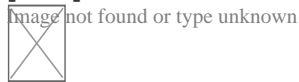
Further reading

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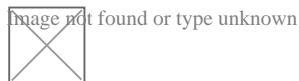
- *BMC Pediatrics* - open access
- *Clinical Pediatrics*
- *Developmental Review* - partial open access
- *JAMA Pediatrics*
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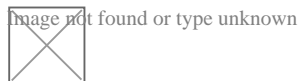
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- Pediatrics Directory at Curlie
- Pediatric Health Directory at OpenMD

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Medicine

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

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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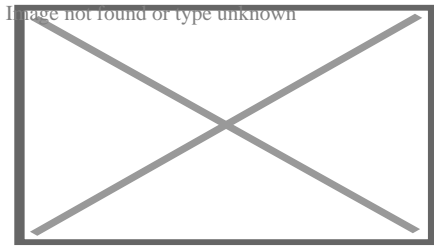
- NARA

About health professional

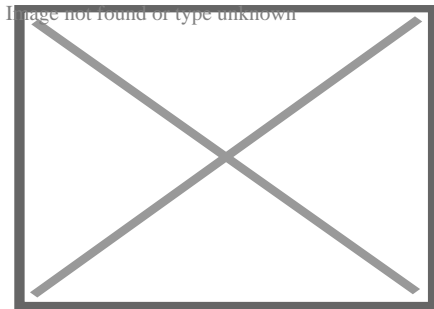
A **health professional**, **healthcare professional**, or **healthcare worker** (sometimes abbreviated **HCW**)[¹] is a provider of health care treatment and advice based on formal training and experience. The field includes those who work as a nurse, physician (such as family physician, internist, obstetrician, psychiatrist, radiologist, surgeon etc.), physician assistant, registered dietitian, veterinarian, veterinary technician, optometrist, pharmacist, pharmacy technician, medical assistant, physical therapist, occupational therapist, dentist, midwife, psychologist, audiologist, or healthcare scientist, or who perform services in allied health professions. Experts in public health and community health are also health professionals.

Fields

[edit]



NY College of Health Professions massage therapy class

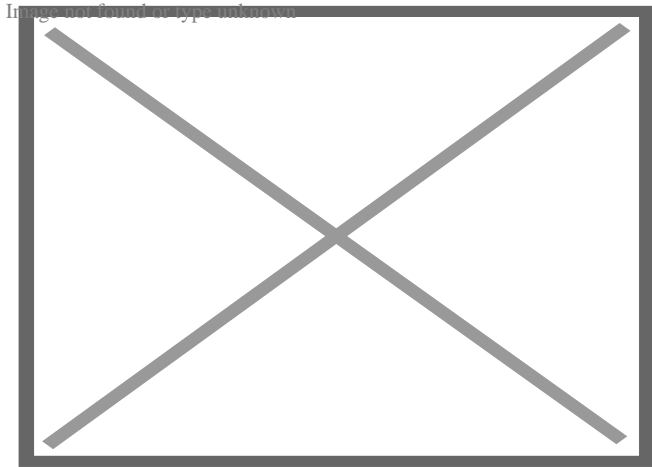


US Navy doctors deliver a healthy baby

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**Health practitioners
and professionals**

- Athletic trainer
- Audiologist
- Chiropractor
- Clinical coder
- Clinical nurse specialist
- Clinical officer
- Community health worker
- Dentist
- Dietitian and nutritionist
- Emergency medical technician
- Feldsher
- Health administrator
- Medical assistant
- Medical laboratory scientist
- Medical transcriptionist
- Nurse anesthetist
- Nurse practitioner
- Nurse midwife
- Nurse
- Occupational Therapist
- Optometrist
- Paramedic
- Pharmacist
- Pharmaconomist
- Pharmacy technician
- Phlebotomist
- Physician
- Physician assistant
- Podiatrist
- Psychologist
- Psychotherapist
- Physical therapist
- Radiographer
- Radiotherapist
- Respiratory therapist
- Speech-language pathologist
- Social Work
- Surgeon
- Surgeon's assistant
- Surgical technologist



70% of global health and social care workers are women, 30% of leaders in the global health sector are women

The healthcare workforce comprises a wide variety of professions and occupations who provide some type of healthcare service, including such direct care practitioners as physicians, nurse practitioners, physician assistants, nurses, respiratory therapists, dentists, pharmacists, speech-language pathologist, physical therapists, occupational therapists, physical and behavior therapists, as well as allied health professionals such as phlebotomists, medical laboratory scientists, dieticians, and social workers. They often work in hospitals, healthcare centers and other service delivery points, but also in academic training, research, and administration. Some provide care and treatment services for patients in private homes. Many countries have a large number of community health workers who work outside formal healthcare institutions. Managers of healthcare services, health information technicians, and other assistive personnel and support workers are also considered a vital part of health care teams.^[2]

Healthcare practitioners are commonly grouped into health professions. Within each field of expertise, practitioners are often classified according to skill level and skill specialization. "Health professionals" are highly skilled workers, in professions that usually require extensive knowledge including university-level study leading to the award of a first degree or higher qualification.^[3] This category includes physicians, physician assistants, registered nurses, veterinarians, veterinary technicians, veterinary assistants, dentists, midwives, radiographers, pharmacists, physiotherapists, optometrists, operating department practitioners and others. Allied health professionals, also referred to as "health associate professionals" in the International Standard Classification of Occupations, support implementation of health care, treatment and referral plans usually established by medical, nursing, respiratory care, and other health professionals, and usually require formal qualifications to practice their profession. In addition, unlicensed assistive personnel assist with providing health care services as permitted.^[citation needed]

Another way to categorize healthcare practitioners is according to the sub-field in which they practice, such as mental health care, pregnancy and childbirth care, surgical care, rehabilitation care, or public health.^[*citation needed*]

Mental health

[edit]

Main article: Mental health professional

A mental health professional is a health worker who offers services to improve the mental health of individuals or treat mental illness. These include psychiatrists, psychiatry physician assistants, clinical, counseling, and school psychologists, occupational therapists, clinical social workers, psychiatric-mental health nurse practitioners, marriage and family therapists, mental health counselors, as well as other health professionals and allied health professions. These health care providers often deal with the same illnesses, disorders, conditions, and issues; however, their scope of practice often differs. The most significant difference across categories of mental health practitioners is education and training.^[4] There are many damaging effects to the health care workers. Many have had diverse negative psychological symptoms ranging from emotional trauma to very severe anxiety. Health care workers have not been treated right and because of that their mental, physical, and emotional health has been affected by it. The SAGE author's said that there were 94% of nurses that had experienced at least one PTSD after the traumatic experience. Others have experienced nightmares, flashbacks, and short and long term emotional reactions.^[5] The abuse is causing detrimental effects on these health care workers. Violence is causing health care workers to have a negative attitude toward work tasks and patients, and because of that they are "feeling pressured to accept the order, dispense a product, or administer a medication".^[6] Sometimes it can range from verbal to sexual to physical harassment, whether the abuser is a patient, patient's families, physician, supervisors, or nurses.^[*citation needed*]

Obstetrics

[edit]

Main articles: Obstetrics, Midwifery, and Birth attendant

A maternal and newborn health practitioner is a health care expert who deals with the care of women and their children before, during and after pregnancy and childbirth. Such health practitioners include obstetricians, physician assistants, midwives, obstetrical nurses and many others. One of the main differences between these professions is in the training and authority to provide surgical services and other life-saving interventions.^[7] In some developing countries, traditional birth attendants, or traditional midwives, are the primary source of pregnancy and childbirth care for many women and families, although they are not certified or licensed. According to research, rates for unhappiness among obstetrician-gynecologists (Ob-Gyns) range somewhere between 40 and 75 percent.^[8]

Geriatrics

[edit]

Main articles: Geriatrics and Geriatric care management

A geriatric care practitioner plans and coordinates the care of the elderly and/or disabled to promote their health, improve their quality of life, and maintain their independence for as long as possible.^[9] They include geriatricians, occupational therapists, physician assistants, adult-gerontology nurse practitioners, clinical nurse specialists, geriatric clinical pharmacists, geriatric nurses, geriatric care managers, geriatric aides, nursing aides, caregivers and others who focus on the health and psychological care needs of older adults.^[*citation needed*]

Surgery

[edit]

A surgical practitioner is a healthcare professional and expert who specializes in the planning and delivery of a patient's perioperative care, including during the anaesthetic, surgical and recovery stages. They may include general and specialist surgeons, physician assistants, assistant surgeons, surgical assistants, veterinary surgeons, veterinary technicians, anesthesiologists, anesthesiologist assistants, nurse anesthetists, surgical nurses, clinical officers, operating department practitioners, anaesthetic technicians, perioperative nurses, surgical technologists, and others.^[*citation needed*]

Rehabilitation

[edit]

A rehabilitation care practitioner is a health worker who provides care and treatment which aims to enhance and restore functional ability and quality of life to those with physical impairments or disabilities. These include physiatrists, physician assistants, rehabilitation nurses, clinical nurse specialists, nurse practitioners, physiotherapists, chiropractors, orthotists, prosthetists, occupational therapists, recreational therapists, audiologists, speech and language pathologists, respiratory therapists, rehabilitation counsellors, physical rehabilitation therapists, athletic trainers, physiotherapy technicians, orthotic technicians, prosthetic technicians, personal care assistants, and others.^[10]

Optometry

[edit]

Main article: Optometry

Optometry is a field traditionally associated with the correction of refractive errors using glasses or contact lenses, and treating eye diseases. Optometrists also provide general eye care, including screening exams for glaucoma and diabetic retinopathy and management of routine or eye conditions. Optometrists may also undergo further training in order to specialize in various fields, including glaucoma, medical retina, low vision, or paediatrics. In some countries, such as the United Kingdom, United States, and Canada, Optometrists may also undergo further training in order to be able to perform some surgical procedures.

Diagnostics

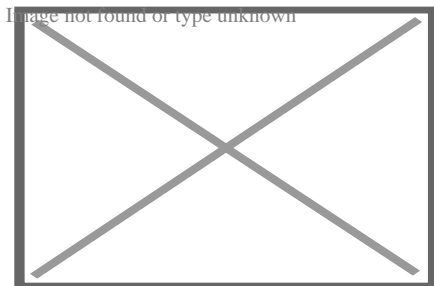
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Main article: Medical diagnosis

Medical diagnosis providers are health workers responsible for the process of determining which disease or condition explains a person's symptoms and signs. It is most often referred to as diagnosis with the medical context being implicit. This usually involves a team of healthcare providers in various diagnostic units. These include radiographers, radiologists, Sonographers, medical laboratory scientists, pathologists, and related professionals. ^{*[citation needed]*}

Dentistry

[edit]



Dental assistant on the right supporting a dental operator on the left, during a procedure.

Main article: Dentistry

A dental care practitioner is a health worker and expert who provides care and treatment to promote and restore oral health. These include dentists and dental surgeons, dental assistants, dental auxiliaries, dental hygienists, dental nurses, dental technicians, dental therapists or oral health therapists, and related professionals.

Podiatry

[edit]

Care and treatment for the foot, ankle, and lower leg may be delivered by podiatrists, chiroprodists, pedorthists, foot health practitioners, podiatric medical assistants, podiatric nurse and others.

Public health

[edit]

A public health practitioner focuses on improving health among individuals, families and communities through the prevention and treatment of diseases and injuries, surveillance of cases, and promotion of healthy behaviors. This category includes community and preventive medicine specialists, physician assistants, public health nurses, pharmacist, clinical nurse specialists, dietitians, environmental health officers (public health inspectors), paramedics, epidemiologists, public health dentists, and others. ^[*citation needed*]

Alternative medicine

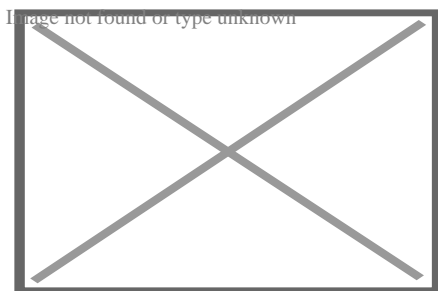
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In many societies, practitioners of alternative medicine have contact with a significant number of people, either as integrated within or remaining outside the formal health care system. These include practitioners in acupuncture, Ayurveda, herbalism, homeopathy, naturopathy, Reiki, Shamballa Reiki energy healing Archived 2021-01-25 at the Wayback Machine, Siddha medicine, traditional Chinese medicine, traditional Korean medicine, Unani, and Yoga. In some countries such as Canada, chiropractors and osteopaths (not to be confused with doctors of osteopathic medicine in the United States) are considered alternative medicine practitioners.

Occupational hazards

[edit]

See also: Occupational hazards in dentistry and Nursing § Occupational hazards



A healthcare professional wears an air sampling device to investigate exposure to airborne influenza

A video describing the Occupational Health and Safety Network, a tool for monitoring occupational hazards to health care workers

The healthcare workforce faces unique health and safety challenges and is recognized by the National Institute for Occupational Safety and Health (NIOSH) as a priority industry sector in the National Occupational Research Agenda (NORA) to identify and provide intervention strategies regarding occupational health and safety issues.^[11]

Biological hazards

[edit]

Exposure to respiratory infectious diseases like tuberculosis (caused by *Mycobacterium tuberculosis*) and influenza can be reduced with the use of respirators; this exposure is a significant occupational hazard for health care professionals.^[12] Healthcare workers are also at risk for diseases that are contracted through extended contact with a patient, including scabies.^[13] Health professionals are also at risk for contracting blood-borne diseases like hepatitis B, hepatitis C, and HIV/AIDS through needlestick injuries or contact with bodily fluids.^{[14][15]} This risk can be mitigated with vaccination when there is a vaccine available, like with hepatitis B.^[15] In epidemic situations, such as the 2014-2016 West African Ebola virus epidemic or the 2003 SARS outbreak, healthcare workers are at even greater risk, and were disproportionately affected in both the Ebola and SARS outbreaks.^[16]

In general, appropriate personal protective equipment (PPE) is the first-line mode of protection for healthcare workers from infectious diseases. For it to be effective against highly contagious diseases, personal protective equipment must be watertight and prevent the skin and mucous membranes from contacting infectious material. Different levels of personal protective equipment created to unique standards are used in situations where the risk of infection is different. Practices such as triple gloving and multiple respirators do not provide a higher level of protection and present a burden to the worker, who is additionally at increased risk of exposure when removing the PPE. Compliance with appropriate personal protective equipment rules may be difficult in certain situations, such as tropical environments or low-resource settings. A 2020 Cochrane systematic review found low-quality evidence that using more breathable fabric in PPE, double gloving, and active training reduce the risk of contamination but that more randomized controlled trials are needed for how best to train healthcare workers in proper PPE use.^[16]

Tuberculosis screening, testing, and education

[edit]

Based on recommendations from The United States Center for Disease Control and Prevention (CDC) for TB screening and testing the following best practices should be followed

when hiring and employing Health Care Personnel.[¹⁷]

When hiring Health Care Personnel, the applicant should complete the following:[¹⁸] a TB risk assessment,[¹⁹] a TB symptom evaluation for at least those listed on the Signs & Symptoms page,[²⁰] a TB test in accordance with the guidelines for Testing for TB Infection,[²¹] and additional evaluation for TB disease as needed (e.g. chest x-ray for HCP with a positive TB test)[¹⁸] The CDC recommends either a blood test, also known as an interferon-gamma release assay (IGRA), or a skin test, also known as a Mantoux tuberculin skin test (TST).[²¹] A TB blood test for baseline testing does not require two-step testing. If the skin test method is used to test HCP upon hire, then two-step testing should be used. A one-step test is not recommended.[¹⁸]

The CDC has outlined further specifics on recommended testing for several scenarios.[²²] In summary:

1. Previous documented positive skin test (TST) then a further TST is not recommended
2. Previous documented negative TST within 12 months before employment OR at least two documented negative TSTs ever then a single TST is recommended
3. All other scenarios, with the exception of programs using blood tests, the recommended testing is a two-step TST

According to these recommended testing guidelines any two negative TST results within 12 months of each other constitute a two-step TST.

For annual screening, testing, and education, the only recurring requirement for all HCP is to receive TB education annually.[¹⁸] While the CDC offers education materials, there is not a well defined requirement as to what constitutes a satisfactory annual education. Annual TB testing is no longer recommended unless there is a known exposure or ongoing transmission at a healthcare facility. Should an HCP be considered at increased occupational risk for TB annual screening may be considered. For HCP with a documented history of a positive TB test result do not need to be re-tested but should instead complete a TB symptom evaluation. It is assumed that any HCP who has undergone a chest x-ray test has had a previous positive test result. When considering mental health you may see your doctor to be evaluated at your discretion. It is recommended to see someone at least once a year in order to make sure that there has not been any sudden changes.[²³]

Psychosocial hazards

[edit]

Occupational stress and occupational burnout are highly prevalent among health professionals.[²⁴] Some studies suggest that workplace stress is pervasive in the health care industry because of inadequate staffing levels, long work hours, exposure to infectious diseases and hazardous substances leading to illness or death, and in some countries threat

of malpractice litigation. Other stressors include the emotional labor of caring for ill people and high patient loads. The consequences of this stress can include substance abuse, suicide, major depressive disorder, and anxiety, all of which occur at higher rates in health professionals than the general working population. Elevated levels of stress are also linked to high rates of burnout, absenteeism and diagnostic errors, and reduced rates of patient satisfaction.^[25] In Canada, a national report (*Canada's Health Care Providers*) also indicated higher rates of absenteeism due to illness or disability among health care workers compared to the rest of the working population, although those working in health care reported similar levels of good health and fewer reports of being injured at work.^[26]

There is some evidence that cognitive-behavioral therapy, relaxation training and therapy (including meditation and massage), and modifying schedules can reduce stress and burnout among multiple sectors of health care providers. Research is ongoing in this area, especially with regards to physicians, whose occupational stress and burnout is less researched compared to other health professions.^[27]

Healthcare workers are at higher risk of on-the-job injury due to violence. Drunk, confused, and hostile patients and visitors are a continual threat to providers attempting to treat patients. Frequently, assault and violence in a healthcare setting goes unreported and is wrongly assumed to be part of the job.^[28] Violent incidents typically occur during one-on-one care; being alone with patients increases healthcare workers' risk of assault.^[29] In the United States, healthcare workers experience 2/3 of nonfatal workplace violence incidents.^[28] Psychiatric units represent the highest proportion of violent incidents, at 40%; they are followed by geriatric units (20%) and the emergency department (10%). Workplace violence can also cause psychological trauma.^[29]

Health care professionals are also likely to experience sleep deprivation due to their jobs. Many health care professionals are on a shift work schedule, and therefore experience misalignment of their work schedule and their circadian rhythm. In 2007, 32% of healthcare workers were found to get fewer than 6 hours of sleep a night. Sleep deprivation also predisposes healthcare professionals to make mistakes that may potentially endanger a patient.^[30]

COVID pandemic

[edit]

Especially in times like the present (2020), the hazards of health professional stem into the mental health. Research from the last few months highlights that COVID-19 has contributed greatly to the degradation of mental health in healthcare providers. This includes, but is not limited to, anxiety, depression/burnout, and insomnia.^[citation needed]

A study done by Di Mattei et al. (2020) revealed that 12.63% of COVID nurses and 16.28% of other COVID healthcare workers reported extremely severe anxiety symptoms at the peak of the pandemic.^[31] In addition, another study was conducted on 1,448 full time employees in Japan. The participants were surveyed at baseline in March 2020 and then again in May 2020. The result of the study showed that psychological distress and anxiety had increased more among healthcare workers during the COVID-19 outbreak.^[32]

Similarly, studies have also shown that following the pandemic, at least one in five healthcare professionals report symptoms of anxiety.^[33] Specifically, the aspect of "anxiety was assessed in 12 studies, with a pooled prevalence of 23.2%" following COVID.^[33] When considering all 1,448 participants that percentage makes up about 335 people.

Abuse by patients

[edit]

- The patients are selecting victims who are more vulnerable. For example, Cho said that these would be the nurses that are lacking experience or trying to get used to their new roles at work.^[34]
- Others authors that agree with this are Vento, Cainelli, & Vallone and they said that, the reason patients have caused danger to health care workers is because of insufficient communication between them, long waiting lines, and overcrowding in waiting areas.^[35] When patients are intrusive and/or violent toward the faculty, this makes the staff question what they should do about taking care of a patient.
- There have been many incidents from patients that have really caused some health care workers to be traumatized and have so much self doubt. Goldblatt and other authors said that there was a lady who was giving birth, her husband said, "Who is in charge around here"? "Who are these sluts you employ here".^[5] This was very avoidable to have been said to the people who are taking care of your wife and child.

Physical and chemical hazards

[edit]

Slips, trips, and falls are the second-most common cause of worker's compensation claims in the US and cause 21% of work absences due to injury. These injuries most commonly result in strains and sprains; women, those older than 45, and those who have been working less than a year in a healthcare setting are at the highest risk.^[36]

An epidemiological study published in 2018 examined the hearing status of noise-exposed health care and social assistance (HSA) workers sector to estimate and compare the prevalence of hearing loss by subsector within the sector. Most of the HSA subsector prevalence estimates ranged from 14% to 18%, but the Medical and Diagnostic Laboratories

subsector had 31% prevalence and the Offices of All Other Miscellaneous Health Practitioners had a 24% prevalence. The Child Day Care Services subsector also had a 52% higher risk than the reference industry.^[37]

Exposure to hazardous drugs, including those for chemotherapy, is another potential occupational risk. These drugs can cause cancer and other health conditions.^[38]

Gender factors

[edit]

Female health care workers may face specific types of workplace-related health conditions and stress. According to the World Health Organization, women predominate in the formal health workforce in many countries and are prone to musculoskeletal injury (caused by physically demanding job tasks such as lifting and moving patients) and burnout. Female health workers are exposed to hazardous drugs and chemicals in the workplace which may cause adverse reproductive outcomes such as spontaneous abortion and congenital malformations. In some contexts, female health workers are also subject to gender-based violence from coworkers and patients.^{[39][40]}

Workforce shortages

[edit]

See also: Health workforce, Doctor shortage, and Nursing shortage

Many jurisdictions report shortfalls in the number of trained health human resources to meet population health needs and/or service delivery targets, especially in medically underserved areas. For example, in the United States, the 2010 federal budget invested \$330 million to increase the number of physicians, physician assistants, nurse practitioners, nurses, and dentists practicing in areas of the country experiencing shortages of trained health professionals. The Budget expands loan repayment programs for physicians, nurses, and dentists who agree to practice in medically underserved areas. This funding will enhance the capacity of nursing schools to increase the number of nurses. It will also allow states to increase access to oral health care through dental workforce development grants. The Budget's new resources will sustain the expansion of the health care workforce funded in the Recovery Act.^[41] There were 15.7 million health care professionals in the US as of 2011.^[36]

In Canada, the 2011 federal budget announced a Canada Student Loan forgiveness program to encourage and support new family physicians, physician assistants, nurse practitioners and nurses to practice in underserved rural or remote communities of the country, including communities that provide health services to First Nations and Inuit populations.^[42]

In Uganda, the Ministry of Health reports that as many as 50% of staffing positions for health workers in rural and underserved areas remain vacant. As of early 2011, the Ministry was conducting research and costing analyses to determine the most appropriate attraction and retention packages for medical officers, nursing officers, pharmacists, and laboratory technicians in the country's rural areas.^[43]

At the international level, the World Health Organization estimates a shortage of almost 4.3 million doctors, midwives, nurses, and support workers worldwide to meet target coverage levels of essential primary health care interventions.^[44] The shortage is reported most severe in 57 of the poorest countries, especially in sub-Saharan Africa.

Nurses are the most common type of medical field worker to face shortages around the world. There are numerous reasons that the nursing shortage occurs globally. Some include: inadequate pay, a large percentage of working nurses are over the age of 45 and are nearing retirement age, burnout, and lack of recognition.^[45]

Incentive programs have been put in place to aid in the deficit of pharmacists and pharmacy students. The reason for the shortage of pharmacy students is unknown but one can infer that it is due to the level of difficulty in the program.^[46]

Results of nursing staff shortages can cause unsafe staffing levels that lead to poor patient care. Five or more incidents that occur per day in a hospital setting as a result of nurses who do not receive adequate rest or meal breaks is a common issue.^[47]

Regulation and registration

[edit]

Main article: Health professional requisites

Practicing without a license that is valid and current is typically illegal. In most jurisdictions, the provision of health care services is regulated by the government. Individuals found to be providing medical, nursing or other professional services without the appropriate certification or license may face sanctions and criminal charges leading to a prison term. The number of professions subject to regulation, requisites for individuals to receive professional licensure, and nature of sanctions that can be imposed for failure to comply vary across jurisdictions.

In the United States, under Michigan state laws, an individual is guilty of a felony if identified as practicing in the health profession without a valid personal license or registration. Health professionals can also be imprisoned if found guilty of practicing beyond the limits allowed by their licenses and registration. The state laws define the scope of practice for medicine, nursing, and a number of allied health professions.^[48]^[unreliable source?] In Florida, practicing medicine without the appropriate license is a crime classified as a third degree felony,^[49] which may give imprisonment up to five years. Practicing a health care profession without a license which results in serious bodily injury classifies as a second degree felony,^[49]

] providing up to 15 years' imprisonment.

In the United Kingdom, healthcare professionals are regulated by the state; the UK Health and Care Professions Council (HCPC) protects the 'title' of each profession it regulates. For example, it is illegal for someone to call himself an Occupational Therapist or Radiographer if they are not on the register held by the HCPC.

See also

[edit]

- List of healthcare occupations
- Community health center
- Chronic care management
- Electronic superbill
- Geriatric care management
- Health human resources
- Uniform Emergency Volunteer Health Practitioners Act

References

[edit]

1. ^ "HCWs With Long COVID Report Doubt, Disbelief From Colleagues". *Medscape*. 29 November 2021.
2. ^ World Health Organization, 2006. *World Health Report 2006: working together for health*. Geneva: WHO.
3. ^ "Classifying health workers" (PDF). *World Health Organization*. Geneva. 2010. Archived (PDF) from the original on 2015-08-16. Retrieved 2016-02-13.
4. ^ "Difference Between Psychologists and Psychiatrists". *Psychology.about.com*. 2007. Archived from the original on April 3, 2007. Retrieved March 4, 2007.
5. ^ **a b** Goldblatt, Hadass; Freund, Anat; Drach-Zahavy, Anat; Enosh, Guy; Peterfreund, Ilana; Edlis, Neomi (2020-05-01). "Providing Health Care in the Shadow of Violence: Does Emotion Regulation Vary Among Hospital Workers From Different Professions?". *Journal of Interpersonal Violence*. **35** (9–10): 1908–1933. doi:10.1177/0886260517700620. ISSN 0886-2605. PMID 29294693. S2CID 19304885.
6. ^ Johnson, Cheryl L.; DeMass Martin, Suzanne L.; Markle-Elder, Sara (April 2007). "Stopping Verbal Abuse in the Workplace". *American Journal of Nursing*. **107** (4): 32–34. doi:10.1097/01.naj.0000271177.59574.c5. ISSN 0002-936X. PMID 17413727.
7. ^ Gupta N et al. "Human resources for maternal, newborn and child health: from measurement and planning to performance for improved health outcomes. Archived 2015-09-24 at the Wayback Machine *Human Resources for Health*, 2011, 9(16). Retrieved 20 October 2011.

8. ^ "Ob-Gyn Burnout: Why So Many Doctors Are Questioning Their Calling". *healthcareers.com*. Retrieved 2023-05-22.
9. ^ Araujo de Carvalho, Islene; Epping-Jordan, JoAnne; Pot, Anne Margriet; Kelley, Edward; Toro, Nuria; Thiyagarajan, Jotheeswaran A; Beard, John R (2017-11-01). "Organizing integrated health-care services to meet older people's needs". *Bulletin of the World Health Organization*. **95** (11): 756–763. doi:10.2471/BLT.16.187617 (inactive 5 December 2024). ISSN 0042-9686. PMC 5677611. PMID 29147056.cite journal: CS1 maint: DOI inactive as of December 2024 (link)
10. ^ Gupta N et al. "Health-related rehabilitation services: assessing the global supply of and need for human resources." Archived 2012-07-20 at the Wayback Machine *BMC Health Services Research*, 2011, 11:276. Published 17 October 2011. Retrieved 20 October 2011.
11. ^ "National Occupational Research Agenda for Healthcare and Social Assistance | NIOSH | CDC". *www.cdc.gov*. 2019-02-15. Retrieved 2019-03-14.
12. ^ Bergman, Michael; Zhuang, Ziqing; Shaffer, Ronald E. (25 July 2013). "Advanced Headforms for Evaluating Respirator Fit". National Institute for Occupational Safety and Health. Archived from the original on 16 January 2015. Retrieved 18 January 2015.
13. ^ FitzGerald, Deirdre; Grainger, Rachel J.; Reid, Alex (2014). "Interventions for preventing the spread of infestation in close contacts of people with scabies". *The Cochrane Database of Systematic Reviews*. **2014** (2): CD009943. doi:10.1002/14651858.CD009943.pub2. ISSN 1469-493X. PMC 10819104. PMID 24566946.
14. ^ Cunningham, Thomas; Burnett, Garrett (17 May 2013). "Does your workplace culture help protect you from hepatitis?". National Institute for Occupational Safety and Health. Archived from the original on 18 January 2015. Retrieved 18 January 2015.
15. ^ **a b** Reddy, Viraj K; Lavoie, Marie-Claude; Verbeek, Jos H; Pahwa, Manisha (14 November 2017). "Devices for preventing percutaneous exposure injuries caused by needles in healthcare personnel". *Cochrane Database of Systematic Reviews*. **2017** (11): CD009740. doi:10.1002/14651858.CD009740.pub3. PMC 6491125. PMID 29190036.
16. ^ **a b** Verbeek, Jos H.; Rajamaki, Blair; Ijaz, Sharea; Sauni, Riitta; Toomey, Elaine; Blackwood, Bronagh; Tikka, Christina; Ruotsalainen, Jani H.; Kilinc Balci, F. Selcen (May 15, 2020). "Personal protective equipment for preventing highly infectious diseases due to exposure to contaminated body fluids in healthcare staff". *The Cochrane Database of Systematic Reviews*. **2020** (5): CD011621. doi:10.1002/14651858.CD011621.pub5. hdl:1983/b7069408-3bf6-457a-9c6f-ecc38c00ee48. ISSN 1469-493X. PMC 8785899. PMID 32412096. S2CID 218649177.
17. ^ Sosa, Lynn E. (April 2, 2019). "Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019". *MMWR. Morbidity and Mortality Weekly Report*. **68** (19): 439–443. doi:10.15585/mmwr.mm6819a3. PMC 6522077. PMID 31099768.
18. ^ **a b c d** "Testing Health Care Workers | Testing & Diagnosis | TB | CDC". *www.cdc.gov*. March 8, 2021.

19. ^ "Health Care Personnel (HCP) Baseline Individual TB Risk Assessment" (PDF). [cdc.gov](https://www.cdc.gov). Retrieved 18 September 2022.
20. ^ "Signs & Symptoms | Basic TB Facts | TB | CDC". www.cdc.gov. February 4, 2021.
21. ^ **a b** "Testing for TB Infection | Testing & Diagnosis | TB | CDC". www.cdc.gov. March 8, 2021.
22. ^ "Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings, 2005". www.cdc.gov.
23. ^ Spoorthy, Mamidipalli Sai; Pratapa, Sree Karthik; Mahant, Supriya (June 2020). "Mental health problems faced by healthcare workers due to the COVID-19 pandemic—A review". *Asian Journal of Psychiatry*. **51**: 102119. doi:10.1016/j.ajp.2020.102119. PMC 7175897. PMID 32339895.
24. ^ Ruotsalainen, Jani H.; Verbeek, Jos H.; Mariné, Albert; Serra, Consol (2015-04-07). "Preventing occupational stress in healthcare workers". *The Cochrane Database of Systematic Reviews*. **2015** (4): CD002892. doi:10.1002/14651858.CD002892.pub5. ISSN 1469-493X. PMC 6718215. PMID 25847433.
25. ^ "Exposure to Stress: Occupational Hazards in Hospitals". NIOSH Publication No. 2008–136 (July 2008). 2 December 2008. doi:10.26616/NIOSH/PUB2008136. Archived from the original on 12 December 2008.
26. ^ *Canada's Health Care Providers, 2007 (Report)*. Ottawa: Canadian Institute for Health Information. 2007. Archived from the original on 2011-09-27.
27. ^ Ruotsalainen, JH; Verbeek, JH; Mariné, A; Serra, C (7 April 2015). "Preventing occupational stress in healthcare workers". *The Cochrane Database of Systematic Reviews*. **2015** (4): CD002892. doi:10.1002/14651858.CD002892.pub5. PMC 6718215. PMID 25847433.
28. ^ **a b** Hartley, Dan; Ridenour, Marilyn (12 August 2013). "Free On-line Violence Prevention Training for Nurses". National Institute for Occupational Safety and Health. Archived from the original on 16 January 2015. Retrieved 15 January 2015.
29. ^ **a b** Hartley, Dan; Ridenour, Marilyn (September 13, 2011). "Workplace Violence in the Healthcare Setting". NIOSH: Workplace Safety and Health. Medscape and NIOSH. Archived from the original on February 8, 2014.
30. ^ Caruso, Claire C. (August 2, 2012). "Running on Empty: Fatigue and Healthcare Professionals". NIOSH: Workplace Safety and Health. Medscape and NIOSH. Archived from the original on May 11, 2013.
31. ^ Di Mattei, Valentina; Perego, Gaia; Milano, Francesca; Mazzetti, Martina; Taranto, Paola; Di Pierro, Rossella; De Panfilis, Chiara; Madeddu, Fabio; Preti, Emanuele (2021-05-15). "The "Healthcare Workers' Wellbeing (Benessere Operatori)" Project: A Picture of the Mental Health Conditions of Italian Healthcare Workers during the First Wave of the COVID-19 Pandemic". *International Journal of Environmental Research and Public Health*. **18** (10): 5267. doi:10.3390/ijerph18105267. ISSN 1660-4601. PMC 8156728. PMID 34063421.
32. ^ Sasaki, Natsu; Kuroda, Reiko; Tsuno, Kanami; Kawakami, Norito (2020-11-01). "The deterioration of mental health among healthcare workers during the COVID-19 outbreak: A population-based cohort study of workers in Japan". *Scandinavian Journal of Work*,

Environment & Health. **46** (6): 639–644. doi:10.5271/sjweh.3922. ISSN 0355-3140. PMC 7737801. PMID 32905601.

33. ^ a b Pappa, Sofia; Ntella, Vasiliki; Giannakas, Timoleon; Giannakoulis, Vassilis G.; Papoutsis, Eleni; Katsaounou, Paraskevi (August 2020). "Prevalence of depression, anxiety, and insomnia among healthcare workers during the COVID-19 pandemic: A systematic review and meta-analysis". *Brain, Behavior, and Immunity*. **88**: 901–907. doi:10.1016/j.bbi.2020.05.026. PMC 7206431. PMID 32437915.
34. ^ Cho, Hyeonmi; Pavek, Katie; Steege, Linsey (2020-07-22). "Workplace verbal abuse, nurse-reported quality of care and patient safety outcomes among early-career hospital nurses". *Journal of Nursing Management*. **28** (6): 1250–1258. doi:10.1111/jonm.13071. ISSN 0966-0429. PMID 32564407. S2CID 219972442.
35. ^ Vento, Sandro; Cainelli, Francesca; Vallone, Alfredo (2020-09-18). "Violence Against Healthcare Workers: A Worldwide Phenomenon With Serious Consequences". *Frontiers in Public Health*. **8**: 570459. doi:10.3389/fpubh.2020.570459. ISSN 2296-2565. PMC 7531183. PMID 33072706.
36. ^ a b Collins, James W.; Bell, Jennifer L. (June 11, 2012). "Slipping, Tripping, and Falling at Work". NIOSH: Workplace Safety and Health. Medscape and NIOSH. Archived from the original on December 3, 2012.
37. ^ Masterson, Elizabeth A.; Themann, Christa L.; Calvert, Geoffrey M. (2018-04-15). "Prevalence of Hearing Loss Among Noise-Exposed Workers Within the Health Care and Social Assistance Sector, 2003 to 2012". *Journal of Occupational and Environmental Medicine*. **60** (4): 350–356. doi:10.1097/JOM.0000000000001214. ISSN 1076-2752. PMID 29111986. S2CID 4637417.
38. ^ Connor, Thomas H. (March 7, 2011). "Hazardous Drugs in Healthcare". NIOSH: Workplace Safety and Health. Medscape and NIOSH. Archived from the original on March 7, 2012.
39. ^ World Health Organization. *Women and health: today's evidence, tomorrow's agenda*. Archived 2012-12-25 at the Wayback Machine Geneva, 2009. Retrieved on March 9, 2011.
40. ^ Swanson, Naomi; Tisdale-Pardi, Julie; MacDonald, Leslie; Tiesman, Hope M. (13 May 2013). "Women's Health at Work". National Institute for Occupational Safety and Health. Archived from the original on 18 January 2015. Retrieved 21 January 2015.
41. ^ "Archived copy" (PDF). Office of Management and Budget. Retrieved 2009-03-06 – via National Archives.
42. ^ Government of Canada. 2011. *Canada's Economic Action Plan: Forgiving Loans for New Doctors and Nurses in Under-Served Rural and Remote Areas*. Ottawa, 22 March 2011. Retrieved 23 March 2011.
43. ^ Rockers P et al. *Determining Priority Retention Packages to Attract and Retain Health Workers in Rural and Remote Areas in Uganda*. Archived 2011-05-23 at the Wayback Machine CapacityPlus Project. February 2011.
44. ^ "The World Health Report 2006 - Working together for health". Geneva: WHO: World Health Organization. 2006. Archived from the original on 2011-02-28.

45. ^ Mefoh, Philip Chukwuemeka; Ude, Eze Nsi; Chukwuorji, JohBosco Chika (2019-01-02). "Age and burnout syndrome in nursing professionals: moderating role of emotion-focused coping". *Psychology, Health & Medicine*. **24** (1): 101–107. doi:10.1080/13548506.2018.1502457. ISSN 1354-8506. PMID 30095287. S2CID 51954488.
46. ^ Traynor, Kate (2003-09-15). "Staffing shortages plague nation's pharmacy schools". *American Journal of Health-System Pharmacy*. **60** (18): 1822–1824. doi:10.1093/ajhp/60.18.1822. ISSN 1079-2082. PMID 14521029.
47. ^ Leslie, G. D. (October 2008). "Critical Staffing shortage". *Australian Nursing Journal*. **16** (4): 16–17. doi:10.1016/s1036-7314(05)80033-5. ISSN 1036-7314. PMID 14692155.
48. ^ wiki.bmezone.com --> Practicing Medicine. In turn citing Michigan laws
49. ^ **a b** CHAPTER 2004-256 Committee Substitute for Senate Bill No. 1118 Archived 2011-07-23 at the Wayback Machine State of Florida, Department of State.

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