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Skip to content Dentistry.com While drills and other dental tools have reliably been used for centuries to remove the infected pulp from a decayed tooth, laser dentistry has drastically changed the way dentists approach a root canal procedure. From detecting cavities to killing bacteria that are harmful to the teeth, this technology has been approved by the FDA for treating a variety of common dental conditions.The basics of root canal therapyLearn how laser-assisted root canal therapy is performed, and discover some of the advantages of this treatment method.Why are root canals performed?If a tooth becomes severely decayed or damaged, the innermost area, called the pulp, can become inflamed and infected. This condition is called pulpitis and often occurs when the protective layers of the tooth, or the enamel and dentin, are injured, leaving the root exposed. While there are some situations where the inflammation can be resolved by treating a cavity or other curable cause, a case of irreversible pulpitis often requires a root canal if the tooth is still salvageable.What are the signs of pulpitis?To save a tooth affected by pulpitis, patients should seek prompt treatment. There are several common symptoms that indicate a root canal may be necessary:Tooth sensitivity to hot, cold or sweet foodsInflammation and pain around the siteA foul taste in the mouthBad breathFeverSwollen lymph nodesHow is a root canal performed?The main purpose of root canal therapy is to remove the infected tissue within the affected tooth before refilling and sealing it. Traditionally, this procedure is performed by making an opening to access the inside of the tooth and using dental hand tools to clear out the pulp. The area is often disinfected with an antibiotic and sealed using gutta-percha and a special paste. A temporary filling may be used during the procedure but is replaced with a permanent filling or dental crown once an X-ray confirms the tooth is clear of the infection.The use of laser dentistry for a root canalLaser dentistry can be combined with traditional root canal techniques to more effectively remove the infected pulp and exterminate bacteria, which prevents the infection from reoccurring. Often, a laser drill is used to access the inner chamber, and a soft-tissue laser is used to sterilize the structures of the tooth, including areas such as the dentinal tubules that may be hard to reach with conventional therapy. This procedure offers a more precise way of exposing the pulp of the teeth, preserving more healthy tooth structure. If necessary, the laser can also be used to reshape the dentinal walls of the canal. Less friction is involved in the process, which significantly reduces pain and discomfort.ConclusionWhile there is still research being conducted on the use of laser dentistry as a preferred method for performing a root canal, there are several notable advantages to adopting this method for treating pulpitis. Patients experiencing the symptoms listed in this guide should start a discussion with a dentist today to see if laser-assisted root canal treatment is an option for their situation.Request an appointment here: or call Advanced Dentistry Of Walnut Creek at (925) 937-2273 for an appointment in our Walnut Creek office.Check out what others are saying about our services on Yelp: Read our Yelp reviews.Root canal therapy is a common dental procedure designed to save a tooth thats severely infected or damaged. Traditionally, it involves manually cleaning out the tooths inner pulp and sealing it to prevent further issues. But now, lasers are revolutionizing this process, offering a high-tech twist to an age-old treatment. Laser-assisted root canal treatment uses concentrated light energy to clean, shape, and sterilize the tooths canals with precision. Why does this matter for dental health? Tooth infections can lead to pain, abscesses, and even systemic health problems if untreated. By integrating lasers, dentists can enhance accuracy, reduce discomfort, and improve recovery times. This advancement reflects a broader trend in dentistry toward less invasive, patient-friendly solutions. In this blog, well explore how this cutting-edge technique works, its benefits, and what it means for anyone facing a root canal.A root canal treatment is a dental procedure aimed at repairing a tooth when its inner pulpcontaining nerves, blood vessels, and connective tissuebecomes infected or inflamed. The goal is to remove the damaged tissue, disinfect the area, and seal it to preserve the tooths structure and function. People typically need a root canal due to deep cavities, cracked teeth, or trauma that exposes the pulp to bacteria. Without treatment, the infection can spread, causing abscesses or tooth loss. Traditionally, dentists use small files and chemical irrigants to clean the canals manually. While effective, this method can be time-consuming and sometimes uncomfortable. Root canals have a reputation for being painful, but modern techniquesincluding lasersare changing that perception. Understanding the basics of this procedure sets the stage for appreciating how laser technology takes it to the next level.Root canal treatments have come a long way since their early days. Centuries ago, dentists used crude tools to extract infected pulp, often with limited success and significant pain. By the 20th century, the procedure became more standardized, with hand files and disinfectants improving outcomes. However, it wasnt until recent decades that technology truly transformed dentistry. Rotary instruments sped up the process, while digital imaging allowed for better diagnostics. The introduction of lasers marked a major leap forward, aligning with a broader shift toward precision and patient comfort in dental care. Lasers bring a level of accuracy and efficiency that manual tools cant match, reducing the invasiveness of the procedure. This evolution reflects dentistrys ongoing quest to make treatments faster, safer, and less daunting. Laser-assisted root canals are a prime example of how innovation is reshaping even the most routine dental procedures.Laser-assisted root canal treatment stands apart from its traditional counterpart in several key ways. While conventional methods rely on mechanical files and chemical solutions to clean and shape the canals, lasers use focused light energy to achieve the same goalsoften with greater precision. This shift toward minimally invasive techniques means less trauma to the tooth and surrounding tissues. Lasers can vaporize infected tissue and sterilize the canal system more effectively than chemicals alone, reducing the risk of lingering bacteria. Additionally, the procedure often requires fewer instruments, simplifying the process and potentially shortening chair time. Patients may experience less postoperative pain and swelling, thanks to the lasers gentle approach. By embracing this technology, dentists are moving away from the drill-and-fill mentality toward a future where dental care is both high-tech and highly comfortable.Lasers, or Light Amplification by Stimulated Emission of Radiation, have been used in medicine for decades, and dentistry is no exception. In dental care, lasers emit precise beams of light that can cut, vaporize, or sterilize tissue depending on their wavelength and intensity. For root canals, two types of lasers are commonly employed: Erbium lasers, which excel at removing soft tissue and shaping canals, and Diode lasers, which are ideal for disinfecting. These tools offer unmatched control, allowing dentists to target specific areas without affecting healthy tissue. Beyond root canals, lasers are used for gum surgery, cavity preparation, and teeth whitening, showcasing their versatility. The science is simple yet powerful: laser energy interacts with water molecules in tissue, breaking them down efficiently. This technology brings a sci-fi flair to the dentists chair, making procedures more precise and less intimidating.Laser-assisted root canal treatment follows a streamlined, high-tech process that enhances traditional steps with laser energy. It begins with a thorough diagnosis, often aided by X-rays, to pinpoint the infection. Next, the dentist numbs the area and opens the tooth to access the root canal system. Heres where lasers shine: they assist in cleaning out infected pulp and bacteria with pinpoint accuracy, often replacing or supplementing manual files. The laser then shapes the canal, preparing it for filling, before a final sterilization pass eliminates any remaining microbes. The canal is filled with a biocompatible material and sealed, sometimes with laser assistance to ensure a tight bond. The science behind it? Laser energy vaporizes tissue and disrupts bacterial cell walls, all while minimizing damage to the tooth. This step-by-step approach offers a modern twist on a classic procedure.The journey to a laser-assisted root canal starts with a careful diagnosis. Dentists assess symptoms like tooth pain, sensitivity, or swelling, often using digital X-rays or 3D imaging to confirm pulp infection or damage. This step is crucialit ensures the procedure is necessary and maps out the canal systems layout. Once confirmed, preparation begins. The dentist administers local anesthesia to keep the patient comfortable, then places a rubber dam around the tooth to isolate it and keep it dry. Unlike traditional methods, lasers dont require extensive pre-cleaning with chemicals, as their sterilizing power comes later. The focus here is on precision: lasers demand a clear field, so preparation is meticulous. This stage sets the tone for a smooth, efficient treatment, blending advanced diagnostics with the promise of laser technology to tackle the problem at its root.With the tooth prepped, the dentist moves to access the root canal system. Using a dental drill or laser, they create a small opening in the tooths crown to reach the pulp chamber. Lasers offer a distinct advantage here: their precision allows for a smaller, more conservative entry point, preserving more of the natural tooth structure. Once inside, the dentist locates the canal entrancestiny pathways that can be tricky to navigate. Laser energy can assist by gently clearing debris and providing a clearer view, often paired with magnifying tools like dental microscopes. This step requires skill and accuracy, as missing a canal could leave infection behind. The lasers role in this phase highlights its value as a tool for minimally invasive dentistry, making access both effective and efficient while setting the stage for thorough cleaning.Cleaning the root canal is where lasers truly transform the process. Traditionally, dentists use tiny files and chemical irrigants like sodium hypochlorite to remove infected pulp and bacteria. In laser-assisted treatment, a fine laser tip is inserted into the canal, emitting energy that vaporizes diseased tissue instantly. This isnt just about removallasers also disinfect by penetrating deeper than chemicals, targeting bacteria hiding in microscopic crevices. The heat and light disrupt bacterial cell walls, leaving the canal sterile. Compared to manual methods, this approach reduces the need for multiple instruments and rinse cycles, streamlining the procedure. Patients benefit from less irritation and a lower risk of reinfection. Its a blend of power and precision, showcasing how lasers elevate a critical step in root canal therapy to a new level of effectiveness.After cleaning, the canal must be shaped to hold a filling material securely. In traditional root canals, this involves hand or rotary files to widen and smooth the canal wallsa process that can be time-consuming and imprecise. Lasers simplify this step by using focused energy to sculpt the canal with remarkable accuracy. The lasers ability to ablate tissue evenly ensures a uniform shape, reducing weak spots where bacteria could linger. This precision also means less removal of healthy dentin, preserving the tooths strength. The procedure is faster, too, as lasers can shape in a single pass what might take multiple tools otherwise. Improved efficiency doesnt sacrifice qualitylaser-shaped canals are often better prepared for sealing, enhancing long-term success. This step underscores the technologys role in making root canals less invasive and more reliable.The final step in laser-assisted root canal treatment is filling and sealing the canal to protect it from future infection. After cleaning and shaping, the dentist fills the canal with a rubber-like material called gutta-percha, which conforms to the space. Lasers can assist here by softening the material for a tighter fit or even melting it slightly to bond with the canal walls. Once filled, the tooth is sealed with a temporary or permanent restoration, like a crown. Lasers enhance this process by sterilizing the area one last time before sealing, ensuring no bacteria remain. This meticulous closure is key to the tooths longevitypoor sealing can lead to leaks and reinfection. With lasers, the result is a stronger, more durable seal, giving patients confidence in their restored tooths future.Sterilization is a cornerstone of successful root canal therapy, and lasers excel in this role. Laser energy works by emitting wavelengths that target water molecules in bacterial cells, causing them to explode and die. This process penetrates deeper than traditional chemical disinfectants like bleach, reaching areas manual tools cant. Unlike chemicals, which may leave residue or require rinsing, lasers sterilize cleanly and instantly, reducing irritation. Studies show laser-treated canals have significantly lower bacterial counts, cutting the risk of reinfection. Compared to solutions like sodium hypochlorite, lasers offer a non-toxic alternative with no risk of allergic reactions. This deep-cleaning power is especially valuable in complex canal systems, where bacteria can hide. By leveraging light instead of liquid, lasers bring a futuristic edge to dental sterilization, enhancing outcomes and patient safety in ways traditional methods cant match.Laser-assisted root canal treatment offers a host of advantages over traditional methods. First, it reduces pain and discomfortlasers are gentler on tissues, often requiring less anesthesia and causing minimal swelling. Recovery is faster, too, with many patients resuming normal activities the same day. The precision of lasers leads to better outcomes: cleaner canals, less healthy tissue loss, and a lower chance of complications. Because lasers sterilize so effectively, the risk of reinfection drops significantly. The procedure can also be quicker, thanks to fewer tools and steps, making it a win for busy schedules. Patients often report less anxiety, as the quiet hum of a laser replaces the dreaded drills whine. Overall, this method aligns with modern dentistrys focus on comfort, efficiency, and long-term dental health, making it a game-changer for root canal therapy.While laser-assisted root canals sound like a dental dream, theyre not without drawbacks. One risk is thermal damageif not calibrated properly, lasers could overheat the tooth, harming surrounding tissues. However, skilled dentists mitigate this with precise settings. Another limitation is that lasers may not suit every caseseverely curved canals or dense blockages might still need manual tools. The technology also demands expertise, so not all practitioners are trained to use it effectively. Cost is a factor, too; laser treatments are pricier due to equipment and training expenses, which might deter some patients. Accessibility is another hurdlenot every dental office offers this option, especially in rural areas. For these reasons, lasers arent a one-size-fits-all solution, and traditional methods remain valuable in certain scenarios. Consulting a dentist helps weigh these pros and cons.Not everyone needing a root canal is an automatic fit for laser-assisted treatmentit depends on several factors. Ideal candidates have straightforward canal anatomy, with relatively straight paths lasers can navigate easily. Patients with mild to moderate infections benefit most, as lasers excel at sterilizing without excessive tissue removal. Those seeking minimal discomfort and quick recovery are also great matches, given the procedures gentle nature. However, people with complex canal systems, severe blockages, or allergies to laser-related materials might need traditional methods instead. Age and overall health play a role, toodentists assess these during consultations. The process starts with a thorough exam, often including X-rays, to determine suitability. If youre curious about this option, talk to your dentist. Theyll tailor the recommendation to your tooths condition and your preferences, ensuring the best possible outcome.Root canals have a fearsome reputation, but laser-assisted versions are rewriting the story. Most patients report minimal pain during the procedure, thanks to local anesthesia and the lasers gentle approach. Unlike drills, lasers dont vibrate or generate heat patients can feel, reducing discomfort. Post-treatment soreness is also milderlasers cause less trauma, so swelling and inflammation are limited. Some describe it as a slight ache, manageable with over-the-counter painkillers, fading within a day or two. Pain management is enhanced, too; the precision means fewer nerves are disturbed. For those dreading the root canal experience, lasers offer relief from both physical and psychological stress. While no procedure is entirely pain-free, this technology tackles common fears head-on, making the process far less daunting than the myths suggest. Its a modern answer to an old anxiety.Laser-assisted root canal therapy comes with a higher price tag than traditional methods, typically ranging from $1,000 to $2,000 per tooth, compared to $500-$1,000 for conventional treatment. This cost reflects the advanced equipment, maintenance, and specialized training required. Insurance coverage variessome plans partially cover it, but many classify it as elective, leaving patients to foot more of the bill. Accessibility is another consideration. While urban areas and high-end practices increasingly offer laser options, rural clinics may lag due to the investment needed. Globally, adoption is growing, with countries like the U.S., Japan, and Germany leading the way, though availability depends on local dental trends. For those prioritizing comfort and outcomes, the extra cost might be worth itbut its not yet a universal option. Check with local dentists to gauge pricing and availability near you.Patients whove experienced laser-assisted root canals often rave about the difference. Many highlight the reduced painone reviewer called it a breeze compared to my last root canal, noting only mild soreness afterward. Faster recovery is another win; a patient shared, I was eating dinner that night with no issues. The quieter, drill-free process also eases nervessomeone described it as almost relaxing. Satisfaction rates are high, with studies suggesting over 90% of patients would choose lasers again. Some mention the cost as a downside, but add, Its worth it for the comfort. Negative feedback is rare, usually tied to availability or mild post-op sensitivity. These real-world stories paint a picture of a procedure thats not just effective but genuinely patient-friendly, turning a dreaded dental visit into a surprisingly positive experience.,the free encyclopedia that anyone can edit.117,937 active editors 7,001,389 articles in EnglishThe English-language Wikipedia thanks its contributors for creating more than seven million articles! Learn how you can take part in the encyclopedia's continued improvement.GL Mk.II transmitter vanRadar, Gun Laying, MarkI, or GL Mk.I for short, was an early World WarII radar system developed by the British Army to provide information for anti-aircraft artillery. There were two upgrades, GL/EF (elevation finder) and GL Mk.II (pictured), both improving the ability to determine a target's bearing and elevation. GL refers to the radar's ability to direct the guns onto a target, known as gun laying. The first GL sets were developed in 1936 using separate transmitters and receivers mounted on gun carriages. Several were captured in 1940, leading the Germans to believe falsely that British radar was much less advanced than theirs. The GL/EF attachment provided bearing and elevation measurements accurate to about a degree: this caused the number of rounds needed to destroy an aircraft to fall to 4,100, a tenfold improvement over early-war results. The Mk.II, which was able to directly guide the guns, lowered the rounds-per-kill to 2,750. About 410 Mk.Is and 1,679 Mk.IIs were produced. (Fullarticle...)Recently featured: Andrea NavageroNosy KombaMcDonnell Douglas Phantom in UK serviceArchiveBy emailMore featured articlesAboutLieke Klaver ahead in the women's 400 metres final... that a 400-metre race in 2025 (pictured) was won by Lieke Klaver, who pretended that an absent competitor was running in front of her?... that the land snail Drymaeus poecilus is notable for the striking variety of colors and patterns on its shell?... that a forensic investigation of Signalgate has determined how a journalist was included in a group chat about Operation Rough Rider?... that two of the players involved in the 2005 Vietnamese football match-fixing scandal did not accept payment because they felt ashamed?... that a rebellion against a peace treaty with the Yuan dynasty operated out of the Historic Site of Anti-Mongolian Struggle on Jeju Island?... that Nathan Frink fled the United States with enslaved children to settle in Canada, where he was elected as a Member of the Legislative Assembly and caught in a smuggling conspiracy?... that Seattle's women's ice hockey team has an expected rival, despite not even having played their first game?... that Cave Johnson Couts was separately acquitted for shooting his foreman, firing on funeral mourners, and whipping a native laborer to death?... that characters' scars in an episode of The Last of Us were made with a paste-based appliance and a food mixer?ArchiveStart a new articleNominate an articleNgg wa Thiong'oKenyan writer and activist Ngg wa Thiong'o (pictured) dies at the age of 87.In sumo, nosato Daiki is promoted to yokozuna.In association football, Liverpool win the Premier League title.In motor racing, lex Palou wins the Indianapolis 500.In basketball, the EuroLeague concludes with Fenerbahe winning the Final Four Playoff.Ongoing: Gaza warM23 campaignRussian invasion of UkrainetimelineSudanese civil wartimelineRecent deaths: Phil RobertsonMary K. GaillardPeter DavidAlan YentobGerry ConnollySebastio SalgadoNominate an articleMay 30: Statehood Day in Croatia (1990)Johann Sebastian Bach1431 Hundred Years' War: After being convicted of heresy, Joan of Arc was burned at the stake in Rouen, France.1723 Johann Sebastian Bach (pictured) assumed the office of Thomaskantor in Leipzig, presenting the cantata Die Elenden sollen essen in St.Nicholas Church.1922 The Lincoln Memorial in Washington, D.C., featuring a sculpture of the sixteenth U.S. president Abraham Lincoln by Daniel Chester French, opened.1963 Buddhist crisis: A protest against pro-Catholic discrimination was held outside the National Assembly of South Vietnam in Saigon, the first open demonstration against President Ng nh Dim.2008 The Convention on Cluster Munitions, prohibiting the use, transfer, and stockpiling of cluster bombs, was adopted.Ma Xifan (d.947)Colin Blythe (b.1879)Norris Bradbury (b.1909)Wynonna Judd (b.1964)More anniversaries: May 29May 30May 31ArchiveBy emailList of days of the yearAboutSeventeen performing "Oh My!" in 2018South Korean boy band Seventeen made their debut on May 26, 2015, when they performed a showcase for their debut EP 17 Carat in front of a crowd of 1,000 people. Since then, the group have held 9 concert tours, 13 fan meetings, and have performed at a number of music festivals and awards shows. Their concert tours include the Right Here World Tour, which sold over one million tickets, and the Follow Tour, which was noted by Billboard as being the top grossing K-pop tour of 2023. In 2024, Seventeen made their first appearances at festivals in Europe, when they were the first South Korean act to perform at Glastonbury Festival's Pyramid Stage and as headliners for Lollapalooza Berlin. Seventeen's live performances are well regarded by fans and critics alike, and garnered them the award for Top K-pop Touring Artist at the 2024 Billboard Music Awards. (Fulllist...)Recently featured: Accolades received by Top Gun: MaverickNational preserve76th Primetime Emmy AwardsArchiveMore featured listsIgnace Tonen (1840 or 1841 15 March 1916), also known as Nias or by his Ojibwe name Maiagizis ('right/correct sun'), was a Teme-Augama Anishnabai chief, fur trader, and gold prospector in Upper Canada. He was a prominent employee of the Hudson's Bay Company. Tonen was the elected deputy chief before being the lead chief and later the life chief of his community. In his role as deputy, he negotiated with the Canadian federal government and the Ontario provincial government, advocating for his community to receive annual financial support from both. His attempts to secure land reserves for his community were thwarted by the Ontario premier Oliver Mowat. Tonen's prospecting triggered a 1906 gold rush and the creation of Kerr Addison Mines Ltd., although one of his claims was stolen from him by white Canadian prospectors. This photograph shows Tonen in 1909.Photograph credit: William John Winter; restored by Adam CuerdenRecently featured: Australian white ibisHell Gate BridgeAnemonoides blandaArchiveMore featured picturesCommunity portal The central hub for editors, with resources, links, tasks, and announcements.Village pump Forum for discussions about Wikipedia itself, including policies and technical issues.Site news Sources of news about Wikipedia and the broader Wikimedia movement.Teahouse Ask basic questions about using or editing Wikipedia.Help desk Ask questions about using or editing Wikipedia.Reference desk Ask research questions about encyclopedic topics.Content portals A unique way to navigate the encyclopedia.Wikipedia is written by volunteer editors and hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other volunteer projects: CommonsFree media repository MediaWikiWiki software development Meta-WikiWikimedia project coordination WikibooksFree textbooks and manuals WikidataFree knowledge base WikinewsFree-content news WikiquoteCollection of quotations WikisourceFree-content library WikispeciesDirectory of species WikiversityFree learning tools WikivoyageFree travel guide WiktionaryDictionary and thesaurusThis Wikipedia is written in English. Many other Wikipedias are available; some of the largest are listed below. 1,000,000+ articles DeutschEspaolFranaisItalianoNederlandsPolskiPortugusSvenskaTing Vit 250,000+ articles Bahasa IndonesiaBahasa MelayuBn-lm-gCataletinaDanskEestiEsperantoEuskaraMagyarNorsk bokmlRomnSimple EnglishSloveninaSrpskiSrpskohrvatskiSuomiTrkeOzbekcha 50,000+ articles AsturianuAzrbaycancaBosanskiFryskGaeilgeGalegoHrvatskiKurdLatvieuLietuviNorsk nynorskShqipSlovenina Retrieved from " 2EP by Seventeen17 CaratEP by SeventeenReleasedMay29,2015(2015-05-29)GenreK-popdance-pophip hopLength16:48LanguageKoreanLabelPledis EntertainmentLOEN EntertainmentSeventeen chronology17 Carat(2015)Boys Be(2015)Singles from 17 Carat "Adore U"Released: May 29, 201517 Carat is the debut extended play (EP) by South Korean boy group Seventeen. It was released on May 29, 2015, by Pledis Entertainment and distributed by LOEN Entertainment. "Adore U" serves as the lead single for the EP.17 Carat features five tracks written, co-written, and co-produced by Seventeen's group members. "Adore U" was chosen as the lead single for the EP and was performed on multiple music shows by the group. "Shining Diamond" was used as a pre-single on the group's reality debut show. The group stated that the tracklist was chosen to reflect Seventeen's core concept of "boys' passion".[1] The album has two physical versions: one with a "black" themed photo card set, and the other with a "white" themed photo card set. All copies include a CD containing the songs and a fold-up poster/lyric sheet."Adore U" is the lead single of the extended play. It was written by Woozi, S.Coups, and Yeon Dong-geon.[2] The Korea Herald states "'Adore U' is a funky pop song about a teenage boy trying to navigate through puppy love."[3] It marks the beginning of the group's trilogy composed of the singles Adore U, Mansae, and Pretty U about a boy meeting, falling in love and asking out a girl. The track was composed and arranged by Woozi, Bumzu, and Yeon Dong-geon. The music video for the single was released on May 29, 2015, and was directed by Dee Shin. The dance choreography accompaniment to the song was choreographed by Hoshi and focuses on "storytelling, and on highlighting each member's strengths onstage".[4] The single has sold more than 38,000 digital copies and peaked at number 13 on the Billboard US World Chart.The EP has sold over 82,972 copies in South Korea.[5] It peaked at number 4 on the Korean Gaon Album Chart[6] and number 8 on the US World Billboard Chart.[7]Year-end listsCritic/publicationListRankRef.BillboardThe 10 Best K-pop Album of 2015Placed[8]Hoshi participated in the choreography of "Adore U" and "Shining Diamond", Dino choreographed "Jam Jam".[9]Official track list[10]No.TitleLyricsMusicArrangementsLength1."Shining Diamond"WooziVernonS.CoupsKim Min-jeongWooziMasterKeyRishiMasterKeyRishi3:242.""Adore U"" (; Akkinda)WooziVernonS.CoupsBumzuWooziBumzuYeon Dong-geonWooziBumzuYeon Dong-geon3:073."Ah Yeah" (Hip-Hop unit)S. CoupsVernonWonwooMingyuCream DoughnutRishiCream DoughnutRishi3:294."Jam Jam" (Performance unit + Vernon)WooziHoshiDinoVernonWooziCream DoughnutCream Doughnut3:255."20" (Vocal unit)WooziWooziWon Yeong-heonWon Yeong-heonDong Ne-hyeong3:23Weekly chart performance for 17 CaratChart (2015-2023)PeakpositionJapanese Albums (Oricon)[11]46South Korean Albums (Gaon)[12]4US World Albums (Billboard)[13]8Year-end chart performance for 17 CaratChart (2015)PeakpositionSouth Korean Albums (Gaon)[14]47^ "Seventeen hopes to shine like diamonds with '17 Carat'". The Korea Herald. 26 May 2015. Retrieved 30 November 2016.^ "Adore U". Color Coded Lyrics. 29 May 2015. Retrieved 29 November 2016.^ "Seventeen hopes to shine like diamonds with '17 Carat". The Korea Herald. 26 May 2015. Retrieved 30 November 2016.^ "Seventeen hopes to shine like diamonds with '17 Carat'". The Korea Herald. 26 May 2015. 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Retrieved February 17, 2024.Retrieved from " 3The following pages link to 17 Carat External tools(link counttransclusion countsorted list) See help page for transcluding these entriesShowing 50 items.View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Main Page (links | edit)Pledis Entertainment discography (links | edit)List of 2015 albums (links | edit)2015 in South Korean music (links | edit)Seventeen (South Korean band) (links | edit)S.Coups (links | edit)Vernon (rapper) (links | edit)Wonwoo (links | edit)List of awards and nominations received by Seventeen (links | edit)Seventeen discography (links | edit)Love & Letter (links | edit)Joshua (singer) (links | edit)Seventeen TV (links | edit)17 carat (redirect page) (links | edit)Going Seventeen (links | edit)List of Seventeen live performances (links | edit)Teen, Age (links | edit)Al1 (links | edit)Bumzu (links | edit)Boys Be (EP) (links | edit)You Make My Day (links | edit)You Made My Dawn (links | edit)Jun (Chinese entertainer) (links | edit)List of Stray Kids live performances (links | edit)The8 (links | edit)An Ode (links | edit)Seungkwan (links | edit)Fallin' Flower (links | edit)Heng:gar (links | edit)Semicolon (EP) (links | edit)Your Choice (links | edit)Going Seventeen (web series) (links | edit)Not Alone (Seventeen song) (links | edit)Attacca (EP) (links | edit)Rock with You (Seventeen song) (links | edit)Woozi (links | edit)Hoshi (South Korean singer) (links | edit)Don't Wanna Cry (Seventeen song) (links | edit)Darl+ing (links | edit)Face the Sun (links | edit)Left & Right (Seventeen song) (links | edit)24H (EP) (links | edit)We Make You (links | edit)Hot (Seventeen song) (links | edit)Dream (Seventeen EP) (links | edit)BSS (band) (links | edit)FML (EP) (links | edit)Super (Seventeen song) (links | edit)Always Yours (album) (links | edit)Seventeenth Heaven (links | edit)View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Retrieved from " WhatLinksHere/17_Carat"Root canal therapy is a common procedure designed to treat infections and damage within a tooths pulp. Traditionally, this procedure entails clearing out the damaged or contaminated pulp, then sanitizing the canal and finally sealing it. With advancements in dental technology, laser-assisted root canal therapy has emerged as a modern solution that offers several benefits over conventional methods. This article explores the advantages of this technology and what to expect before, during, and after the treatment.What is Laser-Assisted Root Canal Therapy?This therapy incorporates laser technology to enhance the root canal procedure. Lasers are concentrated light beams that are able to precisely target and treat particular tooth regions. Using lasers to treat root canals aims to improve the efficacy, comfort, and overall success of the treatment.Benefits of Taking This Therapy Targeted Treatment: Lasers can precisely locate and treat infected areas within the root canal system. This precision helps to ensure that all infected tissue is removed while preserving healthy tooth structure.Enhanced Cleaning: Lasers improve the cleaning and disinfection of the root canal, addressing areas that might be difficult to reach with traditional instruments.Less Pain: Often results in less postoperative pain compared to conventional root canal therapy. The laser minimizes trauma to surrounding tissues, reducing inflammation and discomfort.Minimal Anesthesia: Many patients require less local anesthesia during laser-assisted procedures due to the reduced invasiveness of the treatment.Accelerated Recovery: Laser precision reduces the need for extensive drilling and tissue removal, consequently leading to a quicker recovery time. Patients often experience faster healing and reduced swelling, therefore benefiting from a more comfortable postoperative period.Reduced Risk of Infection: Lasers enhanced disinfection lowers the risk of reinfection, promoting better long-term outcomes.Streamlined Procedure: Laser technology allows for more efficient cleaning and shaping of the root canals. This can result in a shorter overall treatment time.Better Visibility: Lasers provide better visibility of the treatment area, making it easier for the dentist to perform the procedure accurately.How Laser-Assisted Root Canal Therapy Works? Initial Consultation and DiagnosisExamination: The dentist will perform a thorough examination, including X-rays, to assess the condition of the tooth and determine if laser-assisted root canal therapy is appropriate.Treatment Plan: On the basis of the assessment, the dentist will develop a customized treatment plan tailored to the specific needs of the patient.Anesthesia: Dentists use local anesthesia to numb the affected tooth and surrounding area, ensuring a comfortable experience during the procedure.Isolation: To keep the tooth dry and free of saliva, a rubber dam is positioned around it, which helps maintain a sterile environment. Moreover, the rubber dam also isolates the tooth from the rest of the mouth, thus preventing any bacteria or other contaminants from entering the work area.Access: The dentist creates a small opening in the tooth to access the root canals.Laser Application: The laser is carefully directed into the root canals to remove infected tissue and disinfect the canal system. The lasers energy helps to clean and shape the canals with high precision.Irrigation: In addition to laser treatment, the canals are irrigated with antiseptic solutions to further enhance cleaning and disinfection.Filling: The canals are filled with a biocompatible substance once they have been cleansed and formed, to seal them and prevent future infection.Restoration: Depending on the extent of damage and the tooths location, your dentist will decide whether to use a filling or crown to restore your tooth.What To Expect After The Procedure? Managing Sensitivity: Some sensitivity and discomfort are normal after the procedure. Over-the-counter pain relievers can help manage any minor discomfort.Oral Hygiene:Proper oral hygiene is crucial to ensure the root canals success and prevent further complications. Regularly brush and floss your teeth, and follow any specific cleaning instructions provided by your dentist.Monitoring: To keep the tooth dry and free of saliva, dentists position a rubber dam around it, which helps maintain a sterile environment. Moreover, the rubber dam also isolates the tooth from the rest of the mouth, thus preventing any bacteria or other contaminants from entering the work area.Long-Term Care: Your dentist will offer advice on how to care for the restored tooth and any signs of complications to watch for.Laser-assisted root canal therapy represents a significant advancement in dental treatment, offering precision, comfort, and efficiency. Indeed, by utilizing the power of lasers, this modern approach to root canal therapy enhances the cleaning and disinfection of the root canal system. Furthermore, it reduces postoperative discomfort and consequently promotes faster healing.If youre facing a root canal procedure, consider discussing the benefits of laser-assisted treatment with your dentist. With its many advantages, this therapy may be the ideal solution for maintaining your oral health and preserving your natural smile.Frequently Asked Questions How does laser-assisted root canal therapy compare in terms of recovery time?Laser-assisted root canal therapy typically results in a more comfortable and quicker recovery than with standard methods. Several factors can contribute to this improvement in recovery time. Firstly, the precision of lasers significantly reduces trauma to the surrounding tissues. By targeting only the infected areas and minimizing damage to healthy tissues, the laser minimizes inflammation and post-treatment pain. How does laser-assisted root canal therapy differ from traditional root canal therapy?The main difference between traditional root canal therapy and laser root canal therapy is the use of laser technology. Traditional root canal therapy relies on manual tools and irrigation supplies to sanitize and sculpt the canals. In contrast, laser-assisted therapy uses a laser to precisely target and remove infected tissue, improve disinfection, and minimize trauma to surrounding tissues. This can lead to less pain, faster healing, and a more efficient procedure. Is laser-assisted root canal therapy painful?Laser-assisted root canal therapy generally causes less pain compared to traditional methods. The laser is less invasive and often reduces the need for extensive drilling, which can minimize discomfort. Most patients experience only mild soreness after the procedure, and many require less local anesthesia due to the reduced invasiveness of the laser. How long does the laser-assisted root canal procedure take?The duration of the laser-assisted root canal procedure varies depending on the complexity of the case and the number of canals involved. However, the use of lasers can streamline the process and potentially shorten the overall treatment time compared to traditional root canal therapy. Your dentist will give you a more precise estimate based on your particular circumstances during the consultation. What should I expect after a laser-assisted root canal procedure?Following the operation, you may experience some sensitivity or slight discomfort. It is normal, and you can easily manage with over-the-counter pain relievers. Its important to carefully follow your dentists post-treatment care instructions. In addition, maintaining good oral hygiene and scheduling any necessary follow-up appointments are crucial steps for ensuring a successful recovery.Contact your dentist promptly for evaluation if you feel excruciating pain, edema, or other concerns. Share copy and redistribute the material in any medium or format for any purpose, even commercially. Adapt remix, transform, and build upon the material for any purpose, even commercially. The licensor cannot revoke these freedoms as long as you follow the license terms. Attribution You must give appropriate credit , provide a link to the license, and indicate if changes were made . You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. A Consultation with Dr. Steven J. Katz This article is endorsed by the Dear Doctor, Does Laser-assisted root canal therapy offer any benefits over traditional treatment? Dear Megan, Your question is an important one in today's world as lasers are supplementing or even replacing drills and other traditional tools for some dental procedures, including root canals. According to the American Association of Endodontists (AAE), millions of teeth are treated and more importantly saved every year with root canal treatment, which becomes necessary when the dental pulp, the living tissue deep inside the tooth, becomes inflamed and/or infected. Let's see how lasers can be of assistance in root canal procedures. Light Amplification by Stimulated Emission of Radiation (LASER) therapy utilizes light beams to remove or modify soft and hard tissues in the mouth. The Food and Drug Administration (FDA) has approved the use of various lasers as an adjunct in root canal procedures. Lasers essentially emit intense focused light energy, the particular properties of which can interact with biologic tissues. Lasers can now be used to open the surface of a tooth to access the root canal, remove diseased tissue, clean, disinfect and shape the canal, and fill it. According to an AAE position paper, the use of lasers in aiding root canal disinfection is more promising than in root canal preparation. Lasers can be used to remove the dental pulp and organic debris, and to even modify (shape and clean) the dentinal walls of the root canals. Once preparation is complete and the root canal is sealed (usually with gutta-percha), the laser may be used to soften and mold the sealant for the root canal system. Lasers can target bacteria and infected material with greater accuracy, at times preserving more of the healthy tooth structure. They can also reduce discomfort by eliminating the jarring sounds of drills as well as limiting the need for local anesthesia. There are reports of less bleeding during root canal surgical procedures and reduced post-operative discomfort and infection. One disadvantage is that laser light travels in a straight line while root canal spaces are rarely straight and traditional instruments offer an advantage since they can be curved to follow the shape of the tooth root. Also, the interactions involved between laser energy and the tooth tissues may cause a rise in temperature, which can damage the canal space and at times even extend to the outer surfaces of the tooth. A recent scientific study comparing the efficacy of laser-activated irrigation of root canals with conventional irrigation to disinfect them found favorable results for the laser technology. Laser-activated irrigation for eradicating bacteria and preventing new bacterial growth was more effective than conventional irrigation delivered via a syringe. While a body of evidence exists on the antibacterial efficacy of high-power laser treatment, the evidence is inconclusive as to whether lasers provide a superior seal or higher clinical success rates than conventional techni

destruction is the main reason for extraction of teeth after root canal therapy, accounting for up to two-thirds of these extractions.[32] Therefore, it is very important to have regular X-rays taken of the root canal to ensure that the tooth is not having any problems that the patient would not be aware of.[citation needed]Endodontic treatment may fail for many reasons: one common reason for failure is inadequate chemomechanical debridement of the root canal. This may be due to poor endodontic access, missed anatomy or inadequate shaping of the canal, particularly in the apical third of the root canal, also due to the difficulty of reaching the accessory canals which are minute canals that extend in from the pulp to the periodontium in a random direction. They are mostly found in the apical third of the root.[33]Exposure of the obturation material to the oral environment may mean the gutta-percha is contaminated with oral bacteria. If complex and expensive restorative dentistry is contemplated then ideally the contaminated gutta percha would be replaced in a retreatment procedure to minimise the risk of failure.The type of bacteria found within a failed canal may differ from the normal infected tooth. Enterococcus faecalis and/or other facultative enteric bacteria or Pseudomonas sp. are found in this situation.Endodontic retreatment is technically demanding; it can be a time-consuming procedure, as meticulous care is required by the dentist. Retreatment cases are typically referred to a specialist endodontist. Use of an operating microscope or other magnification may improve outcomes.Currently, there is no strong evidence favoring surgical or non-surgical retreatment of periapical lesions. However, studies have reported that patients experience more pain and swelling after surgical retreatment compared to non-surgical. When comparing surgical techniques, the use of ultrasonic devices may improve healing after retreatment. Application of nanomotor implants have been proposed to achieve thorough disinfection of the dentine.[34] There is no evidence that the use of antibiotics after endodontic retreatment prevents post-operative infection.[35][36]See also: Endodontic files and reamers and Nickel titanium rotary fileThis section needs additional citations for verification. Please help improve this article by adding citations to reliable sources in this section. Unsourced material may be challenged and removed. (November 2017) (Learn how and when to remove this message)Since 2000, there have been great innovations in the art and science of root canal therapy. Dentists now must be educated on the current concepts in order to optimally perform a root canal procedure. Root canal therapy has become more automated and can be performed faster thanks in part to machine-driven rotary technology and more advanced root canal filling methods. Many root canal procedures are done in one dental visit which may last for around 12 hours. Newer technologies are available (e.g. cone-beam CT scanning) that allow more efficient, scientific measurements to be taken of the dimensions of the root canal, however, the use of CT scanning in endodontics has to be justified.[37] Many dentists use dental loupes to perform root canal therapy, and the consensus is that procedures performed using loupes or other forms of magnification (e.g. a surgical microscope) are more likely to succeed than those performed without them. Although general dentists are becoming versed in these advanced technologies, they are still more likely to be used by root canal specialist (known as endodontists).Laser root canal procedures are a controversial innovation. Lasers may be fast but have not been shown to thoroughly disinfect the whole tooth,[38] and may cause damage to the tooth.[citation needed]Several randomized clinical trials concluded that the use of rotary instruments is associated with a lower incidence of pain following the endodontic procedure when compared to the use of manual hand instruments.[39][40] Corticosteroid intra-oral injections were found to alleviate pain in the first 24 hours in patients with symptomatic irreversible pulp inflammation.[41]Instruments may separate (break) during root canal treatment, meaning a portion of the metal file used during the procedure remains inside the tooth. The file segment may be left behind if an acceptable level of cleaning and shaping has already been completed and attempting to remove the segment would risk damage to the tooth. While potentially disconcerting to the patient, having metal inside of a tooth is relatively common, such as with metal posts, amalgam fillings, gold crowns, and porcelain fused to metal crowns. The occurrence of file separation depends on the narrowness, curvature, length, calcification and number of roots on the tooth being treated. Complications resulting from incompletely cleaned canals, due to blockage from the separated file, can be addressed with surgical root canal treatment.[42] The risk of endodontic files fracturing can be minimised by:[43]Ensuring access cavity allows straight-line introduction of files into canalsCreating a glide path before use of larger taper NiTi filesUsing rotary instruments at the manufacturer's recommended speed and torque settingAdopting a single-use file policy to prevent overuse of filesInspecting the file thoroughly every time before inserting it inside the canalUsing ample amounts of irrigation solutionsAvoiding the use of rotary files in severely curved or dilacerated canalsA sodium hypochlorite incident results in an immediate reaction of severe pain, followed by edema, haematoma and ecchymosis, as a consequence of the solution escaping the confines of the tooth and entering the periapical space.[44] This may be caused iatrogenically by binding or excessive pressure on the irrigant syringe or it may occur if the tooth has an unusually large apical foramen.[45] It is usually self-resolving and may take two to five weeks to fully resolve.[45]Tooth discoloration is common following root canal treatment; however, the exact causes for this are not completely understood.[46] Failure to completely clean out the necrotic soft tissue of the pulp system may cause staining, and certain root canal materials (e.g. gutta percha and root canal sealer cements) can also cause staining.[46] Another possible factor is that the lack of pulp pressure in dentinal tubules once the pulp is removed leads to incorporation of dietary stains in dentin.[46]X-ray explanation of bad root canal therapyAnother common complication of root canal therapy is when the entire length of the root canal is not completely cleaned out and filled (obturated) with root canal filling material (usually gutta percha). On the other hand, the root canal filling material may be extruded from the apex leading to other complications.[citation needed] The X-ray in the right margin shows two adjacent teeth that had received bad root canal therapy. The root canal filling material (3, 4, and 10) does not extend to the end of the tooth roots (5, 6 and 11). The dark circles at the bottom of the tooth roots (7 and 8) indicated infection in the surrounding bone. Recommended treatment is either to redo the root canal therapy or extract the tooth and place dental implants. [citation needed] Poor quality filling material or sealant may also cause root canal treatment to fail.[47]Root-canal-treated teeth may fail to healfor example, if the dentist does not find, clean and fill all of the root canals within a tooth. On a maxillary molar, there is more than a 50% chance that the tooth has four canals instead of just three, but the fourth canal, often called a "mesio-buccal 2", tends to be very difficult to see and often requires special instruments and magnification in order to see it (most commonly found in first maxillary molars; studies have shown an average of 76% up to 96% of such teeth with the presence of an MB2 canal). This infected canal may cause a continued infection or "flare-up" of the tooth. Any tooth may have more canals than expected, and these canals may be missed when the root canal procedure is performed. Sometimes canals may be unusually shaped, making them impossible to clean and fill completely; some infected material may remain in the canal. Sometimes the canal filling does not fully extend to the apex of the tooth, or it does not fill the canal as densely as it should. Sometimes a tooth root may be perforated while the root canal is being treated, making it difficult to fill the tooth. The perforation may be filled with a root repair material, such as one derived from natural cement called mineral trioxide aggregate (MTA). A specialist can often re-treat failing root canals, and these teeth will then heal, often years after the initial root canal procedure.[citation needed]The survival or functionality of the endodontically treated tooth is often the most important aspect of the endodontic treatment outcomes, rather than its apical healing alone.[48] One issue was about the commonly used sanitising substances which incompletely sanitised the root-canal space.[49] A properly restored tooth following root canal therapy yields long-term success rates near 97%. In a large-scale study of over 1.6 million patients who had root canal therapy, 97% had retained their teeth 8 years following the procedure, with most untoward events, such as re-treatment, apical surgery or extraction, occurring during the first 3 years after the initial endodontic treatment.[50] Endodontically treated teeth are prone to extraction mainly due to non-restorable carious destruction, other times due to the improper fit of the crown margins that encircles the tooth which lead to the ingress of bacteria,[51] and to a lesser extent to endodontic-related reasons such as endodontic failure, vertical root fracture, or perforation (procedural error).[32]Nondisruption of the periodontal fiber is a benefit of endodontic over implant therapy (labeled IK)An infected tooth may endanger other parts of the body. People with special vulnerabilities, such as a recent prosthetic joint replacement, an unrepaired congenital heart defect, or immunocompromisation, may need to take antibiotics to protect from infection spreading during dental procedures. The American Dental Association (ADA) asserts that any risks can be adequately controlled. A properly performed root canal treatment effectively removes the infected part of the pulp from the tooth.[citation needed]In the early 1900s, several researchers theorized that bacteria from teeth which had necrotic pulps or which had received endodontic treatment could cause chronic or local infection in areas distant from the tooth through the transfer of bacteria through the bloodstream. This was called the "focal infection theory", and it led some dentists to advocate dental extraction. This theory was discredited in the 1930s.Bacteremia (bacteria in the bloodstream) can be caused by many everyday activities, e.g. brushing teeth, but may also occur after any dental procedure which involves bleeding. It is particularly likely after dental extractions due to the movement of the tooth and force needed to dislodge it, but endodontically treated teeth alone do not cause bacteremia or systemic disease.[52]The alternatives to root canal therapy include no treatment or tooth extraction. Following tooth extraction, options for prosthetic replacement may include dental implants, a fixed partial denture (commonly referred to as a 'bridge'), or a removable denture.[53] There are risks to forgoing treatment, including pain, infection and the possibility of worsening dental infection such that the tooth will become irreparable (root canal treatment will not be successful, often due to excessive loss of tooth structure). If extensive loss of tooth structure occurs, extraction may be the only option.Research comparing endodontic therapy with implant therapy is considerable, both as an initial treatment and in retreatment for failed initial endodontic approaches.[54] Endodontic therapy allows avoidance of disruption of the periodontal fiber, which helps with proprioception for occlusal feedback, a reflex important in preventing patients from chewing improperly and damaging the temporomandibular joint. In a comparison of initial nonsurgical endodontic treatment and single-tooth implants, both were found to have similar success rates.[55] While the procedures are similar in terms of pain and discomfort, a notable difference is that patients who have implants have reported "the worst pain of their life" during the extraction, with the implantation itself being relatively painless. The worst pain of endodontic therapy was reported with the initial anesthetic injection. Some patients receiving implants also describe a dull nagging pain after the procedure, while those with endodontic therapy describe "sensation" or "sensitivity" in the area.[56] Other studies have found that endodontic therapy patients report the maximum pain the day following treatment, while extraction and implantation patients reported maximum pain the end of the week after the operation.[57]Implants also take longer, with a typically 3- to 6-month gap between the tooth implantation and receiving the crown, depending on the severity of infection. With regard to gender, women tend to report higher psychological disability after endodontic therapy, and a higher rate of physical disability after tooth implantation, while men do not show a statistically significant difference in response.[56] Mastication is significantly stronger in endodontically treated teeth as compared to implants.[58] Initial success rates after single tooth implants and endodontic microsurgery are similar the first 2 to 4 years following surgery, though after this the success rate of endodontic microsurgery is decreased as compared to implantation.[57]To an extent, the criteria for success due to the inherent differences in the procedure have historically limited comparisons, with success of endodontic therapy defined as the absence of periapical lucency on radiographs, or the absence of visible cavity at the root of the tooth on imaging. Implant success, on the other hand, is defined by osseointegration, or fusion of the implant to the adjacent maxilla or mandible.[57] Endodontically treated teeth have significantly less requirement for follow up treatment after final restoration, while implants need more appointments to finish treatment and more maintenance.[59]Medicine portalAmerican Association of EndodontistsDental bracesDental implantDental pulpDentistryGum inflammationNickel titanium rotary fileOral and maxillofacial surgeryPeriodontitisRegenerative endodonticsSmear layerTooth extractionToothache^ Cohen S (2006). Pathways of the Pulp. Mosby. ISBN978-0-323-03067-0.^ Nanci A (2012). Ten Cate's Oral Histology: Development, Structure, and Function. Mosby. ISBN978-0-323-07846-7.^ Patel S (2013). The Principles of Endodontics. OUP Oxford. ISBN978-0-19-965751-3.^ Marciano MA, Ordinola-Zapata R, Cunha TV, Duarte MA, Cavenago BC, Garcia RB, Bramante CM, Bernardineli N, Moraes IG (April 2011). 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