What Happens During a Root Canal — Step by Step

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Description:

Root canal treatment explained step by step at CSSC Melbourne. Modern techniques, pain myths debunked, success rates and specialist endodontic care.

Details:

Collins Street Specialist Centre: What happens during a root canal — step by step

Few dental procedures carry a more undeserved reputation than root canal treatment. The reality is that modern endodontic therapy is comfortable and highly successful — it relieves pain and preserves teeth that would otherwise need to come out. Understanding what the treatment actually involves is usually enough to put the anxiety to rest.

At Collins Street Specialist Centre (CSSC), root canal treatments are performed exclusively by endodontists — dental specialists who have completed years of additional postgraduate training in diagnosing and treating disease within the tooth. CSSC is a dedicated specialist dental practice in Melbourne's CBD, where patients receive expert endodontic care in a well-equipped, purpose-built environment. This guide walks through the procedure step by step, explains what to expect at each stage, and addresses the most common misconceptions.

Why root canals are needed

To appreciate what root canal treatment achieves, it helps to understand the anatomy of the tooth itself.

Inside your tooth

Beneath the hard outer layers of enamel and dentine, every tooth contains a soft tissue called the dental pulp. The pulp comprises nerves, blood vessels and connective tissue. It plays an important role in tooth development during childhood, but once a tooth reaches maturity, it can survive without the pulp — the surrounding periodontal tissues continue to nourish and support it.

When the pulp becomes damaged

The pulp can become inflamed or infected as a result of:

- Deep decay — when a cavity penetrates through the enamel and dentine to reach the pulp chamber - Repeated dental procedures — multiple restorative treatments on the same tooth can progressively traumatise the pulp - Cracks or chips — a fracture in the tooth structure can allow bacteria to access the pulp - Trauma — a blow to the tooth, sometimes years prior, can damage the pulp without any visible crack - Advanced periodontal disease — severe gum disease can provide a pathway for bacteria to reach the pulp via the root apex

What happens if left untreated

An inflamed or infected pulp does not resolve without intervention. Without treatment, the consequences typically escalate:

- Pain worsens — what may begin as mild sensitivity can progress to severe, persistent, throbbing pain - Abscess formation — infection can spread from the root into the surrounding alveolar bone - Spread of infection — in rare but serious cases, odontogenic infections can extend to the face, neck or beyond - Bone destruction — chronic infection gradually resorbs the bone surrounding the root apex - Tooth loss — in advanced cases, the tooth may become unsalvageable and require extraction

Root canal treatment removes the damaged pulp, eliminates the source of infection and preserves the natural tooth — avoiding extraction and the clinical and financial consequences that come with replacing it.

Signs you might need a root canal

The following symptoms don't automatically mean you need root canal treatment, but each warrants prompt assessment by a dental professional:

- Severe toothache — particularly throbbing pain that disturbs sleep - Prolonged thermal sensitivity — a response to hot or cold that lingers well beyond the removal of the stimulus (30 seconds or more) - Pain on biting or chewing — suggestive of periapical inflammation - Spontaneous pain — discomfort that arises without any obvious cause - Swelling — of the gingiva adjacent to the affected tooth, or of the face or jaw - A sinus tract — a small, blister-like elevation on the gum near the tooth, which may intermittently discharge - Tooth discolouration — a tooth that gradually darkens relative to its neighbours - Tenderness to percussion or palpation — the tooth or surrounding tissues are painful when tapped or pressed

Worth noting: some teeth with pulpal pathology present with no symptoms at all. The infection may only be identified on a routine radiograph — another reason why regular dental examinations matter.

The root canal procedure — step by step

The following is a detailed account of what occurs during root canal treatment at CSSC, as performed by one of our specialist endodontists.

Step 1: Diagnosis and imaging

Thorough diagnosis comes before any treatment. Your endodontist will conduct a comprehensive clinical assessment, which typically includes:

- Pulp sensibility tests — cold testing, electric pulp testing, percussion (tapping the tooth) and palpation of the surrounding tissues to assess pulpal and periapical status - Periapical radiographs — providing detailed views of the root, surrounding bone and any evidence of periapical pathology - Cone beam CT (CBCT) — in more complex presentations, three-dimensional imaging gives a precise view of root canal anatomy, which can vary considerably between individuals. CSSC has CBCT imaging available on-site

These investigations allow your endodontist to confirm the diagnosis, determine the extent of disease and plan the treatment with confidence.

Step 2: Local anaesthesia

Your endodontist administers local anaesthetic to achieve complete numbness of the affected tooth and the surrounding tissues. The technique is the same type of numbing used for routine restorative dentistry, and it ensures the procedure is entirely pain-free.

A note on anaesthesia: teeth with acute, severe inflammation can occasionally be more resistant to local anaesthetic. Your endodontist is trained in supplementary anaesthetic techniques to manage this effectively. If you experience any discomfort at any point during treatment, let your endodontist know immediately — anaesthesia can be adjusted or supplemented as required.

For patients with dental anxiety, sedation options — including nitrous oxide (happy gas) or intravenous sedation — are also available at CSSC.

Step 3: Rubber dam isolation

A thin rubber sheet, called a rubber dam or dental dam, is placed over the tooth to isolate it from the oral environment. This serves several important clinical purposes:

- Infection control — it prevents salivary contamination of the root canal system during treatment - Patient safety — it protects against the ingestion or inhalation of small instruments and irrigating solutions - Improved operating conditions — it provides a clear, dry field that improves both visibility and precision

The rubber dam is secured with a small clamp on the tooth. While unfamiliar at first, most patients find it quite comfortable — and many appreciate that it removes the need to rinse or swallow during the procedure.

Step 4: Access opening

Your endodontist creates a small opening through the biting surface of a posterior tooth, or the palatal surface of an anterior tooth. This access cavity provides a direct path to the pulp chamber and the root canal entrances.

Throughout this and subsequent steps, a dental operating microscope — providing magnification of up to 25 times — allows your endodontist to clearly visualise the internal anatomy of the tooth and identify all canal orifices with precision.

Step 5: Pulp removal and canal cleaning

This is the central phase of the procedure. Your endodontist will:

1. Remove the pulp tissue — using fine, flexible instruments, the inflamed or infected pulp is carefully debrided from the pulp chamber and from each individual root canal 2. Determine working length — an electronic apex locator measures the precise length of each canal, ensuring instrumentation extends to the root apex without inadvertent over-preparation 3. Shape the canals — the canals are progressively enlarged and shaped using rotary nickel-titanium instruments. These instruments are highly flexible and navigate curved root canals considerably more effectively than traditional stainless steel hand files 4. Irrigate throughout — antimicrobial irrigating solutions, primarily sodium hypochlorite, are used continuously throughout the cleaning and shaping process to eliminate bacteria, dissolve residual pulp tissue and flush canal debris

The process is methodical and precise. Each canal is instrumented to its full working length, and the operating microscope ensures no canals are missed — a particularly significant advantage in specialist practice, as certain teeth have complex anatomy with additional or accessory canals that simply aren't visible without magnification.

Step 6: Disinfection

Following mechanical cleaning and shaping, the canals undergo final disinfection:

- Ultrasonic irrigation — acoustic streaming agitates the irrigating solution within the canals, improving its penetration into complex canal anatomy and dentinal tubules - Calcium hydroxide intracanal dressing — where active infection is present, a medicated dressing may be placed within the canals and a temporary restoration placed. A second appointment, typically within one to four weeks, is then scheduled for obturation once the infection has resolved

Step 7: Canal filling (obturation)

Once the canals have been thoroughly cleaned, shaped and disinfected, they are filled with a biocompatible material:

- Gutta-percha — a natural, rubber-like material that is thermoplasticised and compacted to fill the canal space in three dimensions - Root canal sealer — a thin layer of endodontic cement that bonds the gutta-percha to the canal walls and seals the entire canal system

The goal is a hermetic, three-dimensional seal that prevents bacterial recontamination of the canal system. The quality of obturation is verified radiographically.

Step 8: Temporary or permanent coronal restoration

Following obturation, the access cavity is sealed:

- In most cases, a temporary filling is placed to seal the access opening, and the patient is referred to their general dentist or prosthodontist for definitive restoration - In selected straightforward cases, a permanent filling may be placed at the same appointment

Step 9: Crown placement

This final step is essential to long-term success. The majority of posterior teeth — premolars and molars — that have undergone endodontic treatment require a crown to protect the remaining tooth structure.

Root canal-treated teeth are more susceptible to fracture than vital teeth because they no longer receive a vascular supply. Without adequate coronal protection, the remaining tooth structure is at significant risk of catastrophic fracture — which may result in tooth loss despite technically successful endodontic treatment.

Your general dentist or prosthodontist at CSSC will typically place the definitive crown within several weeks of completing root canal treatment.

Anterior teeth may sometimes be adequately restored with a well-placed composite restoration, but the appropriate approach depends on the extent of remaining tooth structure and your clinician's assessment of your specific situation.

Modern techniques and technology

Endodontics has advanced considerably over recent decades. At CSSC, our endodontists use current best-practice technology throughout every stage of treatment.

Dental operating microscope

The operating microscope is perhaps the most significant advance in contemporary endodontic practice. With magnification of up to 25 times and co-axial illumination, the endodontist can:

- Identify hidden or additional canals — some teeth have accessory canals that are simply not visible to the unaided eye - Detect cracks — microscopic fracture lines that may influence prognosis - Operate with greater precision — every procedural step is performed under direct magnification - Manage complications — including separated instruments, calcified canals and perforation repair

Rotary nickel-titanium instruments

Contemporary root canal instruments are made from a superelastic nickel-titanium alloy capable of flexing through curved canals without fracture. Driven by a controlled rotary handpiece, these instruments clean and shape canal systems more thoroughly, more predictably and more efficiently than conventional hand instrumentation.

Electronic apex locators

These devices determine the precise working length of each canal electronically, reducing the number of radiographs required and improving the accuracy of canal preparation.

3D imaging (CBCT)

Cone beam CT imaging reveals complex root canal morphology, assists in diagnosing subtle periapical pathology and informs treatment planning for challenging cases — including retreatments and teeth with unusual anatomy.

Ultrasonic instruments

Ultrasonic tips serve multiple functions in specialist endodontic practice: precise removal of calcified tissue, identification of hidden canal orifices, post removal and enhanced irrigant activation.

The pain reality: myths vs facts

Root canal treatment continues to carry a largely undeserved reputation for being a painful experience. Here's what the evidence actually shows.

Myth: root canals are extremely painful

With contemporary local anaesthetic techniques and modern instrumentation, root canal treatment should be no more uncomfortable than having a routine filling placed. The overwhelming majority of patients report that the procedure itself is painless. The discomfort that prompted the consultation — caused by the inflamed or infected pulp — is precisely what root canal treatment is designed to relieve.

Myth: it's better to simply extract the tooth

Preserving the natural tooth is almost invariably the preferred clinical outcome. A natural tooth functions more effectively, feels more natural and doesn't require the ongoing management associated with prosthetic replacement. Extraction also results in alveolar bone resorption, mesial drift of adjacent teeth and the need for a replacement option — implant, bridge or removable prosthesis — each of which carries its own clinical and financial considerations.

Myth: root canal treatment causes systemic illness

This claim originates from thoroughly discredited research conducted in the 1920s. There is no credible scientific evidence that root canal treatment causes or contributes to systemic disease. Modern endodontic treatment is safe, effective and supported by an extensive body of peer-reviewed literature.

Myth: if the tooth doesn't hurt, it doesn't need treatment

Teeth with necrotic pulps and established periapical infections frequently cause no pain whatsoever. The infection may be silently destroying alveolar bone at the root apex. Routine radiographic examination is the most reliable way to detect these "silent" infections before they progress.

What you actually experience

During the procedure: - The injection — a brief sensation as the needle is placed, followed by progressive numbness within a few minutes - During treatment — pressure and vibration are normal; pain should not be present. You will hear sounds from the instruments and suction - Duration — most root canal treatments are completed within 60–90 minutes. Complex cases — particularly molars with multiple canals — may require additional time or a second appointment

After the procedure: - Mild post-operative discomfort — the tooth may feel tender to biting pressure for several days. This is a normal inflammatory response and is readily managed with over-the-counter analgesics - Resolution of presenting symptoms — the severe, spontaneous pain that brought you for treatment should have resolved

Success rates

Root canal treatment performed by a specialist endodontist is associated with excellent clinical outcomes:

- Primary root canal treatment: approximately 90–95% success rate - Endodontic retreatment (re-treatment of a previously treated tooth): approximately 75–85% success rate

Success means a tooth that is comfortable, fully functional and free of infection — confirmed at follow-up by radiographic evidence of periapical healing.

Several factors influence treatment outcomes:

- Quality of treatment — specialist endodontists achieve consistently higher success rates, due to advanced training, dedicated technology and clinical experience - Quality of the coronal restoration — a well-sealed crown is critical to preventing coronal microleakage and bacterial recontamination of the canal system - Tooth anatomy — teeth with unusually complex canal morphology present greater technical challenges - Pre-existing pathology — teeth with extensive periapical bone loss, root resorption or vertical root fractures carry a less favourable prognosis

Root canal aftercare

Immediately after treatment

- Residual numbness — local anaesthetic effects typically persist for two to four hours. Avoid eating on the anaesthetised side until full sensation has returned, to prevent inadvertent soft tissue trauma - Protect the treated tooth — avoid loading the tooth with heavy chewing forces until the permanent restoration has been placed; the tooth is at increased fracture risk during this period - Analgesics as required — paracetamol and/or ibuprofen, taken as directed, are appropriate for post-operative discomfort. Most patients need mild analgesia for only two to three days - Mild tenderness is expected — some sensitivity to biting pressure for several days to a week is a normal part of the healing process - Maintain your usual oral hygiene routine — continue brushing and flossing as normal, including around the treated tooth

In the following weeks

- Arrange your definitive restoration promptly — delaying crown placement increases the risk of tooth fracture and potential failure of the root canal treatment - Attend any scheduled review — your endodontist may arrange a follow-up appointment, typically at six to twelve months, to assess periapical healing radiographically

Long term

Root canal-treated teeth can remain functional for a lifetime with appropriate care and maintenance. Your general dentist will monitor the treated tooth at each routine examination. If the treated tooth develops pain, sensitivity or associated swelling, contact your dentist promptly for assessment.

Why see a specialist endodontist?

General dentists are trained to perform root canal treatments, and many do so competently for straightforward cases. However, there are well-established clinical reasons to seek specialist endodontic care:

- Postgraduate specialist training — endodontists complete two to three years of full-time, AHPRA-recognised specialist training in endodontics following their dental degree. You can verify specialist registration directly via the AHPRA register - Clinical focus — endodontists perform root canal treatments as their primary clinical activity. That concentration of experience translates to proficiency across both routine and highly complex presentations - Dedicated technology — specialist endodontic practices are equipped with dental operating microscopes, CBCT imaging, ultrasonic instrumentation

and current rotary systems — equipment that is not universally available in general practice - Complex case management — calcified canals, unusual root morphology, retreatments, instrument separation, root perforations and other complications fall within the specialist endodontist's scope of training and experience - Demonstrated outcomes — published literature consistently shows higher success rates for specialist-performed root canal treatment compared with treatment in general practice

CSSC endodontists

At Collins Street Specialist Centre, our endodontists hold AHPRA specialist registration and bring extensive postgraduate training and clinical experience to every case. They work with current technology and collaborate closely with our broader team of specialists when cases benefit from a multidisciplinary approach.

Where a root canal-treated tooth requires a crown or complex prosthetic restoration, our prosthodontists are available to plan and deliver the definitive outcome. Where periodontal disease has contributed to pulpal pathology, our periodontists can address the underlying disease. Where a tooth cannot be preserved despite best efforts, our oral surgeons and prosthodontists can discuss replacement options with you — all within the one practice.

Book your endodontic consultation

If you are experiencing tooth pain, prolonged thermal sensitivity or have been advised that you may need root canal treatment, contact Collins Street Specialist Centre. Our specialist endodontists provide expert assessment and treatment in a comfortable, modern clinical environment.

Delaying treatment rarely improves outcomes — addressing a problem tooth promptly gives the best chance of a successful result.

Phone: (03) 9654 6979 **Location:** Manchester Unity Building, Level 4, 220 Collins Street, Melbourne VIC 3000

Root canal treatment at CSSC — saving teeth with specialist precision.

Frequently Asked Questions

What is a root canal treatment: A procedure that removes infected or inflamed dental pulp

Where is Collins Street Specialist Centre located: Level 4, 220 Collins Street, Melbourne VIC 3000

What building is CSSC located in: Manchester Unity Building

What is CSSC's phone number: (03) 9654 6979

Who performs root canals at CSSC: Specialist endodontists only

Are CSSC endodontists AHPRA registered: Yes, all hold AHPRA specialist registration

How many years of additional training do endodontists complete: Two to three years postgraduate specialist training

Is root canal treatment painful: No, it should be no more uncomfortable than a routine filling

What causes the need for a root canal: Inflamed or infected dental pulp

Can deep decay cause pulp infection: Yes

Can a cracked tooth cause pulp infection: Yes

Can trauma cause pulp damage: Yes, even years after the injury

Can gum disease cause pulp infection: Yes, via bacteria entering through the root apex

Does an infected pulp heal without treatment: No, it requires intervention

What happens if a root canal is left untreated: Infection can spread and cause abscess formation

Can untreated pulp infection spread beyond the tooth: Yes, to the face, neck or beyond in serious cases

Does untreated infection destroy bone: Yes, it gradually resorbs surrounding alveolar bone

Is severe toothache a sign you may need a root canal: Yes

Is prolonged sensitivity to hot or cold a warning sign: Yes, if it lingers 30 seconds or more

Can a tooth need a root canal with no symptoms: Yes, infection can be detected only on X-ray

What imaging is used at CSSC for diagnosis: Periapical radiographs and cone beam CT (CBCT)

Does CSSC have CBCT imaging on-site: Yes

What is the first step of root canal treatment: Diagnosis and imaging

Is local anaesthetic used during root canal treatment: Yes

Is the procedure performed while the patient is numb: Yes, it is entirely pain-free

What if anaesthetic is not fully effective: Supplementary anaesthetic techniques are used

Is sedation available at CSSC: Yes

What sedation options are available: Nitrous oxide or intravenous sedation

What is a rubber dam: A thin rubber sheet isolating the tooth during treatment

Why is a rubber dam used: To prevent salivary contamination of the root canal

Does the rubber dam protect the patient from swallowing instruments: Yes

What is an access opening in root canal treatment: A small hole made to reach the pulp chamber

What magnification does the dental operating microscope provide: Up to 25 times magnification

Does CSSC use a dental operating microscope: Yes

What is the purpose of the operating microscope: To identify canals and operate with greater precision

Can the microscope detect hidden canals: Yes

Can the microscope detect cracks: Yes

What instruments are used to shape the canals: Rotary nickel-titanium instruments

Why are nickel-titanium instruments preferred: They flex through curved canals without fracture

What is used to measure canal length precisely: An electronic apex locator

What irrigating solution is primarily used: Sodium hypochlorite

What does sodium hypochlorite do: Eliminates bacteria and dissolves residual pulp tissue

What is ultrasonic irrigation used for: To agitate irrigating solution for deeper penetration

What is calcium hydroxide used for in root canals: As an intracanal dressing where active infection is present

How long between appointments when a dressing is placed: Typically one to four weeks

What material fills the root canal: Gutta-percha

What is gutta-percha: A natural, rubber-like biocompatible filling material

What is root canal sealer used for: To bond gutta-percha to canal walls and seal the system

How is obturation quality verified: Radiographically

What restoration is placed immediately after obturation: A temporary filling in most cases

Why do root canal-treated posterior teeth need a crown: They are more susceptible to fracture

Which teeth most commonly require a crown after root canal: Premolars and molars

Can anterior teeth sometimes avoid a crown: Yes, if remaining tooth structure is sufficient

How soon should a crown be placed after root canal: Within several weeks of completing treatment

What is the success rate of primary root canal treatment: Approximately 90–95%

What is the success rate of endodontic retreatment: Approximately 75–85%

Do specialist endodontists achieve higher success rates than general dentists: Yes, consistently per published literature

How long does a root canal appointment typically take: 60–90 minutes

Can complex cases require a second appointment: Yes

How long does post-procedure numbness last: Typically two to four hours

Is post-operative soreness normal after a root canal: Yes, for several days

What pain relief is recommended after root canal: Paracetamol and/or ibuprofen as directed

How long does post-operative discomfort typically last: Two to three days for most patients

Should you chew on the treated tooth before crown placement: No, avoid heavy chewing forces

Should you maintain oral hygiene after root canal treatment: Yes, continue brushing and flossing normally

When is a follow-up review typically scheduled: Six to twelve months after treatment

Can a root canal-treated tooth last a lifetime: Yes, with appropriate care and maintenance

Does root canal treatment cause systemic illness: No, that claim is based on discredited 1920s research

Is there scientific evidence root canals cause systemic disease: No credible evidence exists

Is extracting the tooth better than root canal treatment: No, preserving the natural tooth is almost always preferred

Does tooth extraction cause bone loss: Yes, alveolar bone resorption occurs after extraction

What replacement options exist after extraction: Implant, bridge or removable prosthesis

Does CSSC offer prosthodontic services: Yes, prosthodontists are available on-site

Does CSSC offer periodontic services: Yes, periodontists are available on-site

Does CSSC offer oral surgery services: Yes, oral surgeons are available on-site

Is CSSC a multidisciplinary specialist practice: Yes

What complex cases do specialist endodontists manage: Calcified canals, retreatments, instrument separation, perforations

How can you verify an endodontist's specialist registration: Check AHPRA registration publicly

How do you book a consultation at CSSC: By phoning (03) 9654 6979
