PROCEDURE

Root canal

A root canal removes damaged or infected tissue from inside a tooth and seals it

PURPOSE
Remove infected pulp and preserve the natural tooth

PROCEDURE TYPE
Therapeutic, minimally invasive treatment through the tooth

WHERE IT IS DONE
Dental office or outpatient dental clinic

ANAESTHESIA
Local anaesthesia; sedation sometimes added

HOW LONG IT TAKES
About 60 to 120 minutes per visit

PREPARATION
Usually no fasting; medication review and dental X-rays

RECOVERY
Same day; avoid driving if sedated

MAIN RISKS
Persistent infection, instrument fracture, tooth fracture, treatment failure

RESULTS
Symptom relief within days; X-ray healing over months

Overview

A root canal is a dental procedure used to save a damaged or infected tooth. It is also called root canal treatment or endodontic treatment.

Inside each tooth is a soft area called the pulp. It contains nerves, blood vessels, and connective tissue. If the pulp becomes badly inflamed or infected, it may not be able to heal.

During a root canal, a dentist or endodontist removes the damaged pulp. An endodontist is a dentist with extra training in treating the inside of teeth. The dentist cleans and shapes the narrow root canals, then fills and seals them.

The tooth usually needs a permanent filling or crown afterward. A crown is a strong cap that covers and protects the tooth.

Why the procedure is performed

Root canal treatment may be recommended when the pulp is irreversibly inflamed, dead, or infected. The aim is to remove the source of the problem while keeping your natural tooth.

Pulp damage can follow:

A damaged pulp may cause lingering sensitivity, pain when biting, swelling, or a gum spot that drains. Some affected teeth cause few or no symptoms and are found during an examination or X-ray.

Root canal treatment may also be used for a tooth that previously had treatment but has not healed.

- Deep tooth decay
- A crack, chip, or other injury
- Repeated dental work on the same tooth
- Trauma that damages the pulp, even without a visible crack

Who should and should not have it

A root canal may be suitable if the pulp cannot recover but the rest of the tooth can still be repaired. Keeping the tooth can help maintain your bite and may avoid the need for a bridge, denture, or implant.

It is not the right choice for every tooth. Extraction may be more appropriate if the tooth:

Treatment may be delayed if an unrelated health problem makes dental care unsafe at that time. Tell the dental team about your medical conditions, allergies, pregnancy, medicines, and any previous problems with anaesthesia.

Do not stop blood thinners or other prescribed medicines on your own. The dental team can decide whether any change is needed with the clinician who prescribed them.

- Has a vertical root fracture
- Has too little healthy structure left to support a filling or crown
- Has severe loss of the bone and gum support around it
- Cannot be cleaned, sealed, or restored predictably

How to prepare

Follow the treating facility's own instructions, as these take priority over general advice.

You will usually have an examination and dental X-rays. These help show the tooth roots, surrounding bone, and signs of infection.

If you are having local anaesthesia only, you can generally eat beforehand. If sedation is planned, you may need to stop eating and drinking for a set period. Follow the exact instructions you receive.

Before your appointment:

Antibiotics like amoxicillin or doxycycline are not routinely a substitute for treating the tooth itself. They may be used when infection is spreading or there are wider signs of illness.

- Provide an up-to-date list of medicines and allergies
- Ask whether to take your usual medicines
- Brush and floss as usual unless told otherwise
- Arrange a ride home if you will receive sedation
- Ask whether the final crown will require a separate appointment

What happens during the procedure

The dentist first checks the tooth and reviews its X-rays. Local anaesthetic is injected to numb the tooth and nearby gum. You are usually awake, but you should not feel sharp pain.

A thin rubber sheet called a dental dam is placed around the tooth. It keeps the area dry and prevents cleaning liquids or small instruments from entering your mouth.

The dentist makes a small opening in the tooth. Fine instruments are passed into the root canals to remove the pulp and shape the spaces. Disinfecting liquid is used to wash away debris and reduce bacteria.

The cleaned canals are filled with a rubber-like dental material, commonly gutta-percha, and sealed. The opening is closed with a temporary or permanent filling.

Treatment may take one or more visits. Between visits, medicine may be placed inside the tooth and a temporary filling used. A crown or other permanent restoration is often fitted later, particularly on a back tooth that must withstand strong chewing forces.

Recovery and what to expect afterward

Some tenderness around the tooth or jaw is common after treatment, especially when biting. It should gradually improve. Use pain medicine only as directed by your dental team or according to the product label.

Wait until the numbness has worn off before eating so you do not bite your cheek or tongue. If the tooth has a temporary filling, avoid chewing hard or sticky foods on that side. Follow any food instructions given after the final restoration.

Most people can return to normal light activity the same day. Strenuous activity may need to wait if you had sedation or do not feel well.

You can usually drive after local anaesthesia alone. Do not drive after sedation or general anaesthesia. Arrange for an adult to take you home and follow the facility's restrictions.

Many people return to work the same day or the next day. More time may be helpful if your work is physical, you received sedation, or you have significant discomfort.

Risks and possible complications

Root canal treatment is intended to save the tooth, but healing is not guaranteed.

Possible problems include:

A treated tooth may be more likely to fracture if it has lost a large amount of structure. Completing the recommended permanent filling or crown helps protect it.

- Pain, swelling, or infection after treatment
- A canal that is difficult to find, clean, or seal
- Breakage of a fine instrument inside the canal
- An unintended opening through the side of the root
- Leakage beneath a filling or crown
- Cracking or fracture of the treated tooth
- The need for retreatment, root-end surgery, or extraction

Results and follow up

The dentist can usually tell you when the canals have been cleaned and filled. Relief from pain or pressure may begin within days, but tenderness can take longer to settle.

Healing in the bone around the root is slower. Follow-up dental X-rays may be used over the

following months to check progress.

Attend the appointment for your permanent filling or crown. A temporary filling is not designed to protect the tooth indefinitely. Continue regular dental check-ups and clean the treated tooth like your other teeth.

If symptoms return months or years later, the tooth should be reassessed. A new infection can develop if bacteria enter through decay, a loose restoration, or a crack.

Alternatives

The realistic alternatives depend on whether the pulp can still heal and whether the tooth can be restored.

Pulp-preserving treatment may be possible in selected teeth. A protective material may be placed over the pulp, or only the inflamed upper portion may be removed in a procedure called a pulpotomy. This keeps more living tissue but is not suitable when infection or damage extends through the pulp.

Extraction removes the tooth and the source of infection. It may be quicker or more predictable for a tooth that cannot be restored. The trade-off is a gap, which can affect chewing or allow nearby teeth to move. Replacing the tooth with an implant, bridge, or removable denture requires additional treatment and cost.

Monitoring may be reasonable when findings are uncertain and there is no evidence that the pulp is irreversibly damaged. It avoids immediate treatment but may allow the problem to worsen between checks.

No treatment leaves the damaged or infected tissue in place. Pain may continue or return, infection may spread locally, and saving the tooth may become less likely.

Antibiotics alone do not remove infected pulp and are not a lasting alternative to dental treatment.

When to call your healthcare team

Contact the dental team during office hours if tenderness is not improving, your bite feels uneven, or a temporary filling or crown becomes loose or falls out. These concerns usually need prompt dental review but are not emergencies.

Seek urgent same-day dental or medical advice for:

Call emergency services or go to an emergency department for difficulty breathing or

swallowing, rapidly spreading swelling of the face or neck, or swelling affecting the eye. These symptoms require emergency assessment.

- Increasing facial or gum swelling
- Fever or feeling generally unwell with dental swelling
- Severe or worsening pain that is not controlled as advised
- Pus, a bad taste, or new drainage around the tooth

Common questions

Will I be asleep?

Usually not. Local anaesthesia numbs the tooth while you remain awake. Sedation may help you relax, but general anaesthesia is uncommon for routine root canal treatment.

Can I drive home?

You can generally drive after local anaesthesia alone. You must not drive after sedation or general anaesthesia. Follow the specific restriction given by the treating facility.

How painful is a root canal?

The anaesthetic is intended to prevent sharp pain during treatment. You may notice pressure or movement. Mild to moderate tenderness afterward is possible and should gradually improve.

When will I know if it worked?

The dentist knows immediately whether the canals were filled as planned. Your symptoms may improve over several days, while bone healing is assessed over months with follow-up X-rays.

How many appointments will I need?

Some teeth are treated in one visit. Others need more than one, especially when anatomy is complex, infection needs further cleaning, or a separate appointment is required for a crown.

Will I need a crown?

It depends on the tooth and how much structure remains. Back teeth commonly need crowns because they carry heavy chewing forces. Your dentist should explain the planned final restoration before or soon after treatment.

Sources

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