Root canal treatment
Root canal treatment is a dental procedure to replace a tooth’s damaged or infected pulp with a filling. The pulp consists of specialised dental cells, blood vessels, tissue fibres and some nerve fibres located in the hollow space in the central part of the tooth. The procedure is also known as endodontic treatment.

Success rates for endodontic treatment are generally good. About 90 to 95 per cent of patients who undergo root canal treatment can expect a functional tooth after the treatment. The treated tooth should last a very long time, provided that you maintain good oral hygiene and generally look after your teeth. Of course, no therapy or replacement will last as well as a healthy tooth.

Tooth anatomy

A tooth is mainly made of a hard material called dentine. Enamel is the surface layer that protects the visible part of the tooth (crown). The part of the tooth that sits beneath the gum line is called the root. The root is the ‘prong’ that helps anchor the tooth into the jaw. Generally, front teeth have only one root, while molars have several. There may be several root canals in one root.

The hollow centre of a tooth is called the pulp chamber. This area contains the blood vessels, nerves and pulp. The pulp is a sensitive tissue that provides oxygen, nutrients and feeling to the tooth. The main function of the dental pulp is to regulate the growth and development of the tooth during childhood. The pulp extends from the roof of the pulp chamber down into the bottom of each root canal. Once the tooth is fully formed, nutrition for the tooth comes from the tissues surrounding the root. Therefore, a tooth can function without its pulp and, in the majority of cases, can be kept indefinitely. After endodontic treatment, the tooth is ‘pulpless’, but it is not a dead tooth.

Symptoms of tooth pulp damage or disease

A diseased tooth pulp may cause inflammation or infection. The symptoms of a damaged or diseased tooth pulp may include:

- unprovoked or spontaneous pain
- sensitivity to hot and cold drinks and foods
- pain when biting or chewing
- loosening of the tooth
- swelling of the gum near the affected tooth
- oozing of pus surrounding the affected tooth
- facial swelling.

Sometimes, tooth pulp may become damaged or diseased without presenting any symptoms. In these cases, the problem is usually diagnosed by special tests or x-rays during a dental check-up or treatment for other dental concerns.

Causes of tooth pulp damage or disease

There are many events that can lead to disease or damage to dental pulp. Some of these include:

- deep-seated and untreated dental decay
- decay beneath a deep filling
- trauma that damages a tooth
- habitual tooth grinding (bruxism)
- long-standing cracks in the teeth
- advanced gum disease.

Complications of tooth pulp infection

If tooth pulp infection is left untreated, complications could include:

- spreading infection – once the pulp becomes infected, it loses its ability to fight the spread of the infection. If bacteria find their way into the pulp chamber, the bacteria will multiply unchecked. This can cause a severe infection or an endodontic abscess (a pocket or ‘blister’ of pus) when it spreads into the surrounding bone
- localised bone loss – the infection may spread around the ends of the infected root canal and erode surrounding jaw bone
- loss of tooth – the tooth may have to be removed, which interferes with the person’s ability to bite and chew. Subsequent tooth replacement with dentures, bridges or dental implants are costly and may not be possible or tolerated, especially if the infection has already caused advanced bone loss.
Diagnosis of tooth pulp problems

The dentist will listen to your symptoms, examine your teeth and perform other special investigations including taking x-rays. These x-rays also help the dentist to plan for the root canal treatment by revealing the number, size and curvature and depth of the roots, and showing how complicated the procedure may be.

Root canal procedure

You may need one or more visits to complete the endodontic treatment, depending on the complexity of the case. The exact procedure chosen by your dentist may differ from the procedure outlined here. Ask your dentist for further information.

Root canal treatment has four main aims:

1. removing active decay and infection – any old or leaky fillings, tooth decay, infected nerve tissue, pus and debris are removed
2. shaping the canals – in order to be filled well, the canals within the tooth root need to be shaped into smooth, hollow tunnels that are free of irregularities where residual bacteria may have been harbouring. This shaping process involves small instruments, special disinfectants and medication. It may take a few weeks to months for these solutions to take maximum effect against stubborn bacteria within the tooth, and this step may have to be repeated several times.
3. filling the canals – to prevent bacteria from re-infecting the empty canals in your tooth, they are permanently sealed with a long-lasting barrier material.
4. making the tooth functional again – to make sure no bacteria from the oral environment can leak back into the tooth, a large, well-sealed restoration is put on the tooth (such as a crown). Teeth that require root canal treatment have sometimes lost considerable tooth structure due to previous decay or cracks, and may require further protection in the form of porcelain, gold alloy crowns or other similar materials.

Cosmetic issues after root canal treatment

A normal tooth with a healthy pulp is yellowish-white in colour. A pulp-free tooth may eventually turn grey. The dentist can advise you on appropriate aesthetic (cosmetic dentistry) procedures.

All dentists can perform root canal treatments

All dentists are trained to carry out root canal treatments. Some dentists will refer complicated and emergency cases to an endodontist. (Your dentist will discuss this with you.) Endodontists are dentists who are specialists in root canal treatment.

If you would like a specialist opinion, ask your dentist for a referral to an endodontist.

Where to get help

- Your dentist
- Community dental clinics: Tel. (03) 9341 1000 to find your local clinic
- Royal Dental Hospital of Melbourne:
  - General enquiries or to make an appointment Tel. (03) 9341 1000 or 1800 833 039 (outside Melbourne metro) Monday to Friday, 8:30 am to 5 pm
  - Dental emergencies Tel. 1300 560 054 Monday to Friday 8.00 am to 8.30 pm, weekends and public holidays 8.30 am to 8.00 pm
- Australian Dental Association Victorian Branch: Tel. (03) 8825 4600

References

- Root canal treatment, Columbia University College of Dental Medicine, USA. More information here.
- Cracked teeth, Dental Symptoms, American Association of Endodontists. More information here.

Send us your feedback

- Rate this website
- Your comments
- Questions
- Your details

1/4 How would you rate this website?

- ☑ Excellent
- ☑ Good
- ☑ Average
- ☑ Fair
- ☑ Poor

Next Submit Now Cancel
If you are looking for health or medical advice we recommend that you:

- talk to your doctor or pharmacist
- dial triple zero (000) in an emergency
- ring NURSE-ON-CALL Tel. 1300 60 60 24.

2/4 Your Comments

Tell us who you are

Enter your comments below (optional)

Next Submit Now Cancel

Send us your feedback

- Rate this website
- Your comments
- Questions
- Your details

3/4 Questions

What are you here to do? Looking for information on

Did you find what you were looking for?

- ☑ Yes
- ☐ No

Next Submit Now Cancel

Send us your feedback

Thank you. Your feedback has been successfully sent.

More information

Mouth and teeth

The following content is displayed as Tabs. Once you have activated a link navigate to the end of the list to view its associated content. The activated link is defined as Active Tab

- Mouth and teeth basics
- Mouth conditions
- Dental care for children
- Dental care
- Dental procedures

Mouth and teeth basics

- Calcium
  
  If you don't have enough calcium in your diet, your bones will eventually become weak and brittle.

- Mouth
  
  The mouth helps us to digest our food and communicate through speech.

- Teeth
Teeth have different shapes that reflect the different jobs they do in helping us eat and digest food.

• Tongue
  There are about 9000 taste buds on the average adult tongue.

Mouth conditions

• Cleft palate and cleft lip
  Most cleft palates and cleft lips can be repaired so that appearance and speech develop normally.

• Cold sores
  Cold sores are blisters around the mouth and nose, caused by the herpes simplex virus.

• Dental injuries - knocked out teeth
  A knocked out permanent tooth can survive if it is immediately put back. Do not put a knocked-out baby tooth back.

• Dry mouth syndrome
  A dry mouth is a symptom of an underlying problem, rather than a disease in itself.

• Gum disease
  Brushing teeth regularly helps to prevent gum disease and early treatment can help save affected teeth.

• Halitosis or bad breath
  Having halitosis or bad breath can have a major impact on a person.

• Mouth cancer
  Smoking increases the risk of mouth cancer six-fold.

• Mouth ulcers
  In most cases, mouth ulcers are harmless and resolve by themselves in a few days.

• Teeth - gapped teeth
  In many cases, a gap between the upper front teeth will close by itself.

• Teeth grinding
  Teeth grinding (bruxism) is involuntary clenching or grinding of the teeth, usually during sleep.

Dental care for children

• Dental care - fluoride
  Fluoride in your drinking water is like a constant 'repair kit' for your teeth.

• Dental checks for young children
  Children should have an oral health check by the time they turn two.

• Dental injuries - knocked out teeth
  A knocked out permanent tooth can survive if it is immediately put back. Do not put a knocked-out baby tooth back.

• Dummies
  Dummy sucking should stop before school age to avoid teeth or mouth problems.

• Oral conditions - young children
  Oral thrush, mouth ulcers and cold sores are common oral conditions in babies and young children.

• Recent arrivals, asylum seekers and family support services
  Provides an overview of family support programs and health services available to refugees and asylum seekers living in Victoria.

• Seeing a dentist or dental health practitioner
  There are a range of dental services available to assist you with any dental health problems you or your family may have.

• Teeth development in children
  Teething symptoms are common in children and can be managed without medications.
• Thumb and finger sucking
  Finger or thumb sucking should stop before school age to avoid mouth problems.
• Toothbrushing - children
  Start cleaning your baby's teeth as soon as the first tooth comes through to help prevent tooth decay.

Dental care
• Teeth care
  Tooth decay can be prevented with a good diet, regular tooth brushing and dental check-ups.
• 10 tips on how to eat more calcium
  Reduce your intake of coffee, alcohol and soft drinks. 10 tips on how to eat more calcium.
• 10 tips to look after your teeth
  See your dentist for regular check-ups. 10 tips to look after your teeth.
• Dental erosion
  Visit your dentist regularly so tooth erosion is detected early, helping prevent further tooth surface loss.
• Dental injuries - knocked out teeth
  A knocked out permanent tooth can survive if it is immediately put back. Do not put a knocked-out baby tooth back.
• Dentures
  It is important to look after your dentures and your gums to keep your mouth healthy.
• Gum disease
  Brushing teeth regularly helps to prevent gum disease and early treatment can help save affected teeth.
• Mouthguards
  A mouthguard provides the best protection for the teeth, lips and jaw during sport and leisure activities.
• Pregnancy and teeth
  It's important to look after your teeth and gums when you're pregnant, as gum disease can affect your baby.
• Recent arrivals, asylum seekers and family support services
  Provides an overview of family support programs and health services available to refugees and asylum seekers living in Victoria.

Dental procedures
• Cosmetic dentistry
  Discoloured, chipped or missing teeth can affect self-confidence but cosmetic dentistry techniques can help.
• Dental anxiety and phobia
  Dental anxiety is common, but there are ways to help you manage it. Talk to your dentist about which strategies are right for you.
• Dental fillings
  Dental fillings are used to repair worn, decayed or damaged teeth.
• Dental injuries - knocked out teeth
  A knocked out permanent tooth can survive if it is immediately put back. Do not put a knocked-out baby tooth back.
• Dental sealants
  A dental sealant is a coating applied to the permanent back teeth to prevent tooth decay.
• Dental treatment
  Modern techniques mean that dental and oral health treatment is almost always painless.
• Orthodontic treatment
  Orthodontics involves the use of a range of corrective devices, such as braces and plates, to encourage the teeth to align properly.
• Root canal treatment
Root canal treatment is a dental procedure to replace a tooth's damaged or dead pulp with synthetic filling.

- **Wisdom teeth**
  Wisdom teeth that may cause problems are best taken out sooner rather than later.

**Related Information**

- **Dental fillings**
  Dental fillings are used to repair worn, decayed or damaged teeth...

- **Orthodontic treatment**
  Orthodontics involves the use of a range of corrective devices, such as braces and plates, to encourage the teeth to align properly...

- **Cosmetic dentistry**
  Discoloured, chipped or missing teeth can affect self-confidence but cosmetic dentistry techniques can help...

- **Dental sealants**
  A dental sealant is a coating applied to the permanent back teeth to prevent tooth decay...

- **Wisdom teeth**
  Wisdom teeth that may cause problems are best taken out sooner rather than later...

**Home**

**Related information on other websites**

- American Dental Health Association
- Australian Dental Association
- Australian Dental Association Victorian Branch
- Dental Health Services Victoria
- Illustration – how a tooth decays.

**Content Partner**

This page has been produced in consultation with and approved by: Australian Dental Association Victorian Branch

![ADA Victoria Logo](https://www.ada.org.au)

Last updated: February 2017

Content on this website is provided for information purposes only. Information about a therapy, service, product or treatment does not in any way endorse or support such therapy, service, product or treatment and is not intended to replace advice from your doctor or other registered health professional. The information and materials contained on this website are not intended to constitute a comprehensive guide concerning all aspects of the therapy, product or treatment described on the website. All users are urged to always seek advice from a registered health care professional for diagnosis and answers to their medical questions and to ascertain whether the particular therapy, service, product or treatment described on the website is suitable in their circumstances. The State of Victoria and the Department of Health & Human Services shall not bear any liability for reliance by any user on the materials contained on this website.
My Health Life helps you manage your health

With tools, information and recommendations tailored to you, it’s your personal and secure health dashboard.

Learn more

Medical Dictionary

Enter a search term

Search

Search for your topic using the Merriam Webster medical dictionary

Service Search

Find services near you

Service: Select a service
Location:

Type a minimum of three characters then press UP or DOWN on the keyboard to navigate the autocompleted search results

Find a service

Find a doctor

Need to find a doctor in your local area? Take a look at the general practitioners entry in our health service profiles.

see general practitioner

Recent Activity

Polls polled today are 1.
31 people have watched a video today

- Health topics
  - Conditions and treatments
  - Healthy living
  - Services and support

betterhealth.vic.gov.au