

Root canal treatment / Endodontic therapy

http://www.animated-teeth.com/root_canal/t1_root_canal.htm

Root canal treatment, also known as endodontic therapy, is probably the most maligned of all dental procedures, but the reputation of pain typically associated with "having a root canal" is really not deserved. The majority of people who have undergone root canal treatment typically report that the process itself is no more involved than having a filling placed.

Our pages will describe for you the overall goals of root canal treatment, the treatment's individual steps, and also what other dental work might be necessary for a tooth which has had its root canal treatment completed. We also discuss the costs associated with root canal treatment, what role endodontists play in providing this type of therapy, and why root canal treatment can fail.

What is root canal treatment ?

Root canal therapy refers to the treatment of the inner aspects of a tooth, specifically that area inside a tooth originally occupied by the tooth's "pulp tissue".

Most people would probably refer to a tooth's pulp tissue as its "nerve". While a tooth's pulp tissue does contain nerve fibers it is also composed of arteries, veins, lymph vessels, and connective tissue.

For the purposes of this discussion, so to use a term people seem to be most familiar with, we will use the terms "nerve" and "nerve tissue" to refer to a tooth's pulp tissue.

Where precisely in a tooth is its nerve ?

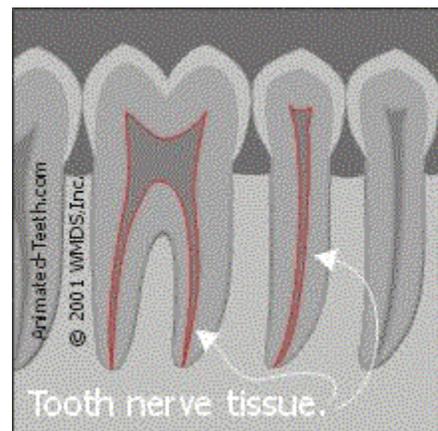
While teeth are hard calcified objects, they are not completely solid. In the inner most aspect of every tooth there lies a hollow space which, when a tooth is healthy, contains the tooth's nerve tissue. Dentists use the following terms to refer to various portions of this nerve area:

The pulp chamber

This is a hollow space that lies more or less in the center of the tooth.

The root canals

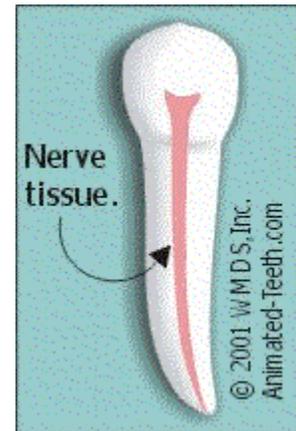
Each tooth's nerve enters the tooth, in generalities, at the tip of its root(s). From this point the nerve then runs through the center of the root in small "root canals" which subsequently join up with the tooth's pulp chamber.



What are the functions of a tooth's nerve tissue ?

You might think that a tooth's nerve tissue is vitally important to a tooth's health and function, but in reality it's not. A tooth's nerve tissue plays an important role in the growth and development of the tooth, but once the tooth has erupted through the gums and has finished maturing the nerve's only function is sensory (it provides the tooth with the ability to feel hot and cold).

In regards to the normal day to day functioning of our mouths, the sensory information provided by a single tooth is really quite minimal. Dentists realize that on a practical level it is pretty much academic whether a tooth has a live nerve in it or not. If a tooth's nerve tissue is present and healthy, wonderful. But if a tooth has had its nerve tissue removed during root canal treatment that's fine too, you will never miss it.



What is the purpose of root canal treatment?

You could say that the purpose of root canal treatment is to create an end result where the tissues surrounding a tooth's root will maintain a healthy status despite the fact that the tooth's nerve has undergone degenerative changes. Specifically, we mean that the tissues surrounding a tooth's root are not affected by bacterial infection and/or irritating substances leaking from those inner aspects of the tooth originally occupied by the tooth's nerve tissue.

Possibly in more scientific terms, our bodies, as a defense mechanism, will initiate an "inflammation reaction" when irritants (such as those seeping out of a problematic tooth) have injured or destroyed body tissues. If incorporating the term "inflammation" into our description we would then say, root canal treatment is the treatment of the inner aspects of a tooth (whose nerve has undergone degenerative changes) so to provide an environment where the tissues surrounding a tooth's root are free of, and will likely to continue to be free of, the presence of inflammation.

How does root canal treatment accomplish this goal ?

In a nutshell, the process of root canal treatment first removes (as thoroughly as possible) bacteria, nerve tissue, the organic debris left over from the breakdown of nerve tissue, and bacterial toxins out from within the inner aspects of a tooth (the area originally occupied by the tooth's nerve tissue). All of these items either are or will produce the tissue irritants that can cause your body to activate an inflammation reaction.

Subsequently, once this space has been cleansed root canal treatment involves filling in and sealing off the interior of the tooth. This is done as a means of minimizing the possibility that bacteria will be able to re-colonize the inner aspects of the tooth or that the interior of the tooth can fill in with tissue fluid that could become stagnant and subsequently break down. (Either of these situations could produce a state of persistent inflammation in the bone that surrounds the tooth's root.) The seal also contains and encapsulates any debris that could not be fully

removed during the cleaning aspect of the root canal treatment process so that it can't leak out and trigger an inflammation reaction.

Why go to all of this trouble ?

If you get an infection, say from bacteria entering a cut in your skin, your body will transport white blood cells to and from the area (by way of your blood vessels and lymphatic system) so to combat the bacteria that have caused the infection. In most cases your body will win the battle and kill off the offending bacteria.

The problem with teeth and infections (and likewise for tissue irritants in general) is that once a tooth's nerve tissue has started to degenerate and bacteria have taken up residence in the tooth's nerve area, there is no effective way for white blood cells to get at the bacteria to combat them. The dying nerve tissue's blood and lymphatic vessels that are normally used to transport white blood cells will have begun to degenerate too.

The net result of all of this is that the nerve space inside a tooth can provide a nice cozy cave-like location for bacteria to persist. It's a place where your body's defensive mechanisms can't effectively get at them. With this scenario, at best your body will only be able to cordon off the infection caused by the bacteria living inside your tooth. At worst, this bacterial infection will overwhelm your body's defense mechanisms and pain and swelling will ensue (an acute tooth abscess).

The idea of root canal treatment is that it provides the bulk of the clean up work for your body. It removes bacteria and tissue irritants that are present inside the tooth, especially those in the locations where your body would have the most trouble combating them. As an end result of its cleaning and sealing aspects, once root canal treatment has been completed it provides your body with an environment where its mechanisms are able to clear away any residual bacteria and tissue irritants that may still be present, thus allowing complete healing (resolution of the inflammation) to occur.

How do you know when your tooth needs root canal treatment ?

It will take an examination by your dentist to determine if root canal treatment is indicated for your tooth. Not only must your dentist determine that this treatment is an appropriate solution for your situation but also that the overall condition of the tooth in question warrants the time and expense involved.

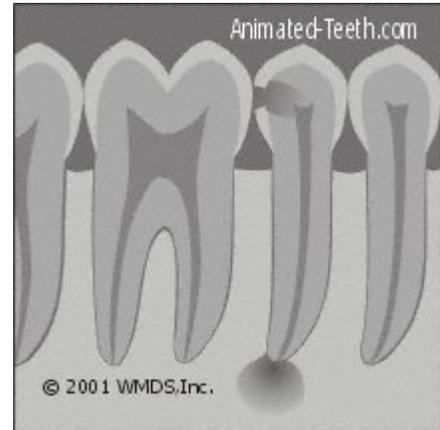
Here are some situations where root canal therapy might be the proper solution:

- ◆ A tooth is currently causing you pain or else has a history of being painful.
- ◆ You have noticed the presence of tenderness and/or swelling in your gums near a tooth.

There can be times when you have a tooth that does need root canal treatment but you are unaware of this fact because there has been no swelling or pain associated with the tooth.

a) Problem teeth identified by x-rays

The nerve tissue in a tooth can die quietly. The degeneration of a tooth's nerve is not always a painful experience. Because of this, on occasion, a tooth's need for root canal treatment can remain undiscovered, even for some years. This is because in these instances the virulence of the infection in the tooth is low and your body's defense mechanism, while not being able to clear up the infection totally, is able to keep it in check.



It is not uncommon that a dentist will identify a tooth which needs root canal treatment during a routine x-ray evaluation. In the most obvious of these cases the x-ray will show a dark spot at the tip of the tooth's root. This dark spot indicates a decrease in the density of the bone surrounding the root's tip. This bone damage has occurred as a result of an infection that is present inside the tooth.

b) A persistent or reoccurring pimple on your gums

Sometimes a tooth whose nerve has died will produce a pimple like lesion on a person's gums. The presence and/or size of these pimples (dentists call them fistulous tracts) can come and go. Because they are literally drains for pus from an infected tooth, a person might notice that they discharge a bad taste (the pus). It is possible that a dentist will pick up on the presence of this type of lesion during their examination, even though the patient hasn't noticed it at all.

c) Exposure of a tooth's nerve

There can be times when your dentist will find that your needed dental work has resulted in the exposure of your tooth's nerve tissue. The term "exposure" simply means that your dentist, while performing your dental work, has literally been able to visualize your tooth's nerve tissue. Sometimes a patient will feel a little prick of pain when the exposure occurs, however many times a patient is totally unaware of the event.



An exposure can lead to the degeneration of a tooth's nerve tissue. Your dentist may determine that in your situation it is best to go ahead and perform root canal treatment on the tooth now so to avoid possible problems and complications with the tooth later (such as a painful tooth abscess).

d) Teeth which have been traumatized in an accident



The health of the nerve tissue in teeth which have a history of having been traumatized (such as being bumped in an accident) can deteriorate, thus leading to the need for root canal treatment.

Immediately after a traumatic event the outlook for the health of a tooth's nerve can be difficult to predict. Sometimes these teeth do quite well, even for many years.

It is always possible however that at some point the health of the tooth's nerve tissue will go ahead and degenerate (often without symptoms). A tip off that the nerve tissue inside a tooth is undergoing degenerative changes is that the tooth, in comparison to its neighbors, appears darkened.

Will you experience pain during your root canal treatment ?

We'd be the first to acknowledge that root canal treatment has a reputation for being painful, but we'd be the last to agree that this reputation is deserved.

It seems most likely that a majority of the derogatory remarks you hear in regards to root canal treatment must be including in them references to that period of pain and discomfort the person experienced leading up to their need for their treatment.

For the average person and the average case, root canal treatment is a non-event and not any more uncomfortable than having a filling placed.

If your confidence needs a little bolstering...

You might be surprised to learn that it is possible that even without anesthetic some teeth needing root canal treatment could be drilled on any you would feel no pain what so ever. In fact, in some cases the entire root canal process could be completed without any anesthetic or pain. Why? Simply because in these cases the nerve tissue in the tooth has died, and dead nerve tissue cannot transmit pain sensations.

Should you expect that any tooth getting root canal therapy could be worked on without anesthetic? No, but if you are unequivocally anticipating that root canal treatment is an excruciatingly painful experience then someone has led you astray.

Will your dentist numb up your tooth prior to performing your root canal treatment ?

Most likely, and especially if you ask them to. Nobody likes a bad time. Not you, not your dentist. Just so things go as smoothly as possible and so there are no surprises, most dentists

will go ahead and numb up any tooth on which they are performing root canal treatment.

Remember, your dentist is trying to perform treatment that will hopefully last you a lifetime. They need to be able to concentrate on their work and not on how you are reacting to it. If they numb up your tooth both of you will be more at ease and relaxed.

Root canal treatment is a "good thing"

There are many reasons why a person should be eager to begin root canal treatment. In those cases where a person's tooth has been causing pain or swelling it is the root canal therapy which begins the process by which a painful or swollen tooth can be settled down. In some cases the beginning steps a dentist takes as a part of performing root canal treatment can provide instant relief. Even in those cases where relief is not total the treatment should at least significantly reduce the pain, and also set the stage where the healing process can begin to take place much more rapidly than it would have if root canal treatment had not been initiated.

Even if an episode of pain and swelling has not been a preceding factor, a person should still be eager to initiate their root canal treatment. In the absence of pain and extensive infection the treatment will just go that much more smoothly. You will be relaxed and well rested. Your tooth will respond to the steps of the procedure more predictably. Additionally, any tooth that needs treatment, but has not yet received it, is unpredictable. Having your root canal treatment completed sooner rather than later reduces the chances that you will experience a painful flare up of the tooth (an acute tooth abscess).

What are the individual steps of root canal treatment?

a) Placing a rubber dam around your tooth

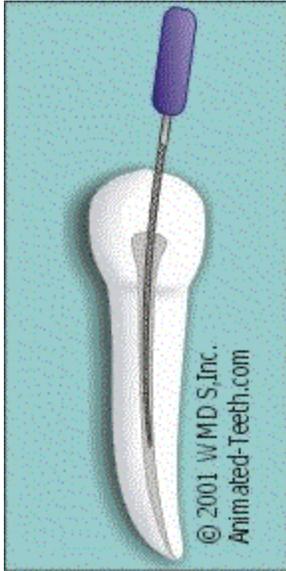
After numbing your tooth but before beginning the actual process of performing the root canal treatment, your dentist will stretch a sheet of rubber around your tooth. Dentists call this sheet of rubber a "rubber dam". It is held in place by a small clamp that grasps your tooth.

The purpose of a rubber dam is as follows. Since one of the fundamental goals of root canal therapy is to clean bacteria out of a tooth, and since saliva does have bacteria in it, the placement of a rubber dam allows the dentist to keep your tooth saliva free so it doesn't get re-contaminated with bacteria while your root canal treatment is being performed.

b) Gaining access to the nerve area of the tooth

So the process of performing your root canal treatment can begin, your dentist must first gain access to that area inside the tooth that needs to be cleaned. This is accomplished by using a dental drill and making an access hole which leads to the pulp chamber of the tooth. On back teeth this hole is made on the chewing surface of the tooth. On front teeth the access hole is made on the tooth's backside.

c) Cleaning the tooth out



The next step of the root canal treatment process is for your dentist to clean out the interior of your tooth. As we discussed previously, this cleaning process will remove any bacteria, toxins, nerve tissue, and related debris harbored inside your tooth.

The bulk of the cleaning process is accomplished by way of your dentist using "root canal files". These objects look like straight pins but on closer inspection you will find that their surface is rough, not smooth. These instruments literally are files and are used as such. Your dentist will work a series of root canal files, each of increasing diameter, up and down in your tooth while simultaneously using a twisting motion. This action will scrape and scrub the sides of the tooth's root canal(s), thus cleaning it out. Additionally, as part of the cleaning process your dentist will wash your tooth out periodically so to help flush away any debris that is present.

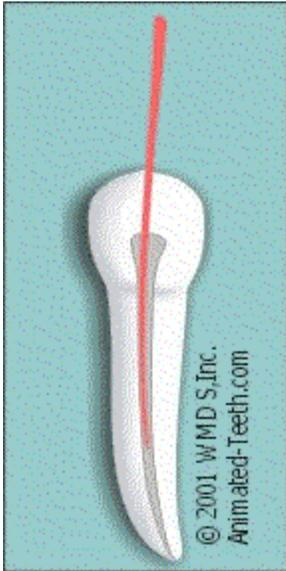
The goal is for your dentist to clean the entire length of the tooth's root canal(s), but not beyond. So to determine the length of a root canal your dentist may place a root canal file in your tooth and then take an x-ray, so to see if it extends the full length of the tooth or not. Alternatively, your dentist may have an electronic device that can make this same determination when it is touched to a file positioned in your tooth.

Traditionally root canal files are manipulated by a dentist by way of using their fingers. There are, however, special dental drills (dental drills are called "handpieces") which can hold and twist these files, and your dentist may choose to use one. As a variation on this same theme, there is yet another type of dental handpiece that produces a cleaning motion by way of holding a root canal file and vibrating it vigorously.

d) Placing the root canal filling material

Once the tooth has been thoroughly cleaned your dentist can fill in and seal up its interior by way of placing root canal filling material. Sometimes a dentist will want to place the filling material the same day that they have cleaned the tooth out. Other times a dentist might feel that it is best to wait about a week before completing the root canal process. In the latter case your dentist will place a temporary filling in your tooth so to keep contaminants out during the time period between your appointments.

What root canal filling material is used ?



The most common root canal filling material being used by dentists now days is a rubber compound called gutta percha. Gutta percha comes in preformed cones that are sized to match the files which have been used to clean out the inside of the tooth.

A root canal sealer (a paste) is usually used in conjunction with gutta percha cones. It is either applied to the cone's surface before the cone is placed into the tooth's root canal, or else applied inside the root canal itself before the gutta percha cone is positioned. Sometimes several cones of gutta percha need to be placed before the interior of the tooth has been adequately filled.

At times a dentist will warm the gutta percha cones (either before or after they are placed into the tooth) so they become softened. This allows the gutta percha to more closely adapt to the precise shape of the interior of the tooth.

As an alternative to the use of preformed cones, sometimes a dentist will place the gutta percha via the use of a gutta percha "gun". This apparatus is somewhat similar to a hot glue gun. It warms a tube of gutta percha so the material is very soft. The gutta percha is then squeezed out into the tooth.

After your dentist has finished the filling and sealing aspect of the root canal process they will place a filling in the access hole they created at the beginning of your treatment. The individual steps of performing the root canal treatment have now been completed.

How long does root canal treatment take ?

The total amount of appointment time that will be required for your root canal treatment can hinge on a number of factors. Some of these are:

- ◆ Different teeth have differing numbers of root canals, each of which will need to be located, cleaned, and sealed. As an example, front teeth typically just have a single root canal while molars often have three or more canals.
- ◆ Will your root canal treatment be completed in just one sitting or will the process be broken up into two appointments? At times a dentist will feel it is best to clean out a tooth during an initial visit and then have you return for a second appointment when they will seal up the interior of your tooth. Equally common place, a dentist may feel that it is preferable to perform both tasks during the same appointment.

You will have to ask your dentist what is indicated in your situation. As a ballpark estimate however, it seems likely that any single appointment will probably last between 30 and 60 minutes.

What should be expected after root canal treatment ?

Will there be any pain or discomfort after the root canal treatment ?

The hope is that after your root canal treatment you will notice very little discomfort from your tooth. It is not uncommon however that for the first day or so after its work a tooth may feel a little tender. Whenever you have a question, in all cases, you should feel free to contact your dentist's office just to ensure that what you are experiencing seems to them to be within normal limits.

A tooth's sensitivity can often be minimized by the use of over-the-counter analgesics, especially those that also possess anti-inflammatory properties. Ibuprofen (Advil or Motrin) can be an effective choice for this type of discomfort, of course you should always read the label, indications, and warnings of any product you anticipate using so to make sure it is appropriate for you.

Should you chew on a tooth that has just had root canal treatment ?

Don't look for trouble. It is usually best to exercise caution with a tooth which is undergoing root canal treatment or has just had its treatment completed. Until your dentist tells you otherwise you should minimize chewing on the tooth. Here are some reasons why:

- ◆ In those cases where more than one root canal treatment appointment is needed the temporary filling that has been placed in your tooth might come out. If it does, saliva and debris will re-contaminate the interior of the tooth. Your dentist will have to spend your next root canal appointment cleaning your tooth out again.
- ◆ Sometimes, since the tooth receiving the root canal treatment feels so much better, a person is eager to make use of their tooth again. Until your dentist has had a chance to finish rebuilding your tooth it should be considered to be fragile. What a disappointment it would be to spend the time, effort, and money to have root canal treatment performed, only to have the tooth irreparably break or crack before it was fully restored.

What additional dental work is needed for a tooth that has had root canal treatment ?

After your tooth's root canal treatment has been completed your dentist will need to discuss with you what additional dental work will be required so to make the tooth fully functional again.

Many times tooth that has required root canal treatment is one that has a large filling or else has large portions of tooth structure missing due to extensive decay or breakage. These teeth, in this state, are not as sturdy as they once were and it is common place that a dentist will recommend that a tooth that has had root canal treatment should be restored using either a dental crown or else a dental crown in combination with a dental post. Your dentist will of course need to determine what is appropriate treatment for your specific situation.

The dental restoration that is used to rebuild a tooth also provides a seal for the tooth. This seal

helps to prevent seepage from the oral cavity into the interior aspects of the tooth. Your dentist will need to advise you as to what they think is best for your situation but, in general, the sooner arrangements can be made to have the permanent dental restoration placed (thus creating the best possible seal) the better.

Placing a post in a tooth that has had root canal treatment

To a dentist, a "post" is a rod that is positioned and cemented in a tooth's root. Typically, but not always, dental posts are made out of metal.

Posts are usually only placed in those teeth which have extensive portions of their natural tooth structure missing. Dentists know, in general, that the greater the amount of a tooth that can extend up into the center of the dental crown, the more stable the crown will be. In those cases where a great deal of tooth structure is missing a dentist will "build up" the height of the tooth using dental filling material. A dental post provides a way for the dentist to securely anchor this filling material core to the tooth.

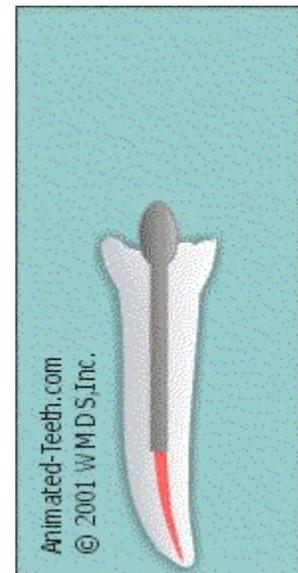
How does a dentist place a post in a tooth ?

To place a post, a dentist will first use a drill so to remove some of the gutta percha filling material that was placed during the tooth's root canal treatment. The post is then cemented into position and a core of filling material is subsequently placed around the post's upper portion, so to increase the overall amount of structure that will extend up into the crown.

Placing a dental crown on a tooth that has had root canal treatment

Crowns are dental restorations that cup over the portion of the tooth that lies above the gum line. People sometimes refer to [dental crowns](#) as "caps". Dental crowns can either be gold or else have a porcelain surface so they look white like the tooth's neighboring teeth.

A dentist will use a dental crown as a means of improving the appearance of a tooth, restoring a broken tooth to its original shape, and/or strengthening a tooth. Additionally, and very importantly, dental crowns create an excellent seal over a tooth. By this we mean that a crown cemented in place provides a barrier that is helpful in preventing bacteria from regaining access to those inner aspects of a tooth where the root canal treatment has been performed. After a tooth has had its root canal treatment completed, any or all of these qualities which a crown can provide may be needed.



What steps are needed to make a dental crown ?

Before a dental crown can be placed the tooth must first be trimmed so it is tapered in shape. This tapered aspect of the tooth will extend up into the dental crown's center and is a very important factor in the crown's stability. After the needed shape has been achieved your dentist will take an impression of the tooth, which in turn is sent to a dental laboratory which will create the crown. Once the dental lab has completed your crown your dentist will cement it in place. ([This link will forward you to our discussion about dental crowns.](#))

How much does root canal treatment cost ?

a) Root canal fees charged by general dentists

Here's a very "ballpark" estimate of the price that you might pay to have root canal treatment performed by a general dentist.

- ◆ Root canal treatment for a front tooth (incisor) [ADA Code 03310] :
\$355.00 - \$560.00
- ◆ Root canal treatment for a back tooth (molar) [ADA Code 03330] :
\$530.00 - \$860.00

Dentists typically base their root canal fees on the number of individual root canals found in the tooth. Front teeth (incisors) commonly just have one root canal while molars usually have three or more. Those teeth that lie between the incisors and molars vary by the fact that they typically have either one or two root canals.

The figures shown here come from an unscientific survey of fees found in our area. Our sources are: the web, dentists, dental literature, and information received from dental insurance companies. Based on ACCRA's Cost of Living Index, we have extrapolated our regional data into the nationwide average fee range estimate shown above. Even in the same area the fee charged by dentists for a specific procedure can vary significantly, easily by as much as 30%.

We anticipate that the lower end of this range would be representative of an average fee found in a small rural town (whose ACCRA Cost of Living Index is approximately 85). The higher end of this range would be more representative of the average fee found in a large metropolitan area on either coast (whose ACCRA Cost of Living Index is around 125).

Check the Cost of Living Index for your area at [Yahoo Real Estate](#). Clicking this link will open a new browser window.

b) Root canal fees charged by endodontists

You can expect that the fee charged for root canal treatment by an endodontist will be greater than that fee charged by a general dentist. Endodontists typically treat the most difficult of teeth and their fee reflects a premium based on the high level of skill and

expertise they offer. An endodontist's fee could easily be 30% to 50% greater than the average fee charged in your area by a general dentist.

Root canal treatment, general dentists, and endodontists

While all dentists receive training in performing root canal treatment in dental school, in the field of dentistry there are root canal specialists. This type of dentist, termed an "endodontist", limits their practice activities to just providing root canal treatment. To become an endodontist a dentist must complete additional years of training after finishing dental school.

Who should perform your root canal treatment, an endodontist or your regular dentist ?

The answer to this question most likely lies in how much expertise your dentist anticipates is needed for the successful treatment of your tooth. Different teeth offer different challenges to a dentist. As an example, it is usually easier for a dentist to perform root canal treatment on front teeth rather than on back teeth. Any tooth, however, has the potential for having its own set of characteristics which makes it a challenge for a dentist to successfully treat, and in these cases your dentist may feel that it is best that an endodontist performs your root canal treatment.

There can be situations where your dentist may feel that the services of an endodontist are required simply to determine what treatment it is that you need. The sources of some dental symptoms are not easily identified and may require the knowledge and experience of an endodontist to locate them.

There is usually a premium attached to the level of expertise an endodontist can provide. Often an endodontist's fee will be higher than that of your regular dentist, but when their level of skill and knowledge is needed it is well worth the expense. In some parts of the country you may find that an endodontist is not conveniently at hand and seeking the services of one may require a trip to a neighboring city.

Let your dentist decide who should perform your root canal treatment

In many, and possibly most situations, your dentist may feel that they are more than capable of providing the treatment your tooth requires. This type of situation is nice because it means that your root canal treatment can be performed in an office with which you are familiar by a dentist you know. The fee your dentist charges for the root canal treatment will probably be less than if you required the services of an endodontist. Additionally, since your dentist knows you, you might find that they are more accommodating with scheduling, billing, and insurance considerations than an endodontist's office would be.

Are there any alternatives to having root canal treatment ?

If root canal therapy is indicated for a tooth there really is no alternative treatment other than an extraction. Root canal treatment deals with the inner aspects of a tooth unlike any other dental

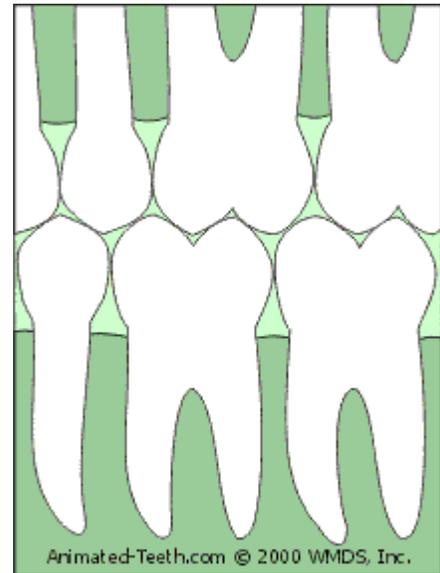
procedure. If it is required, no other dental work can suffice. If root canal treatment will not be a possibility for a tooth then it should be extracted.

Should you have an extraction rather than root canal treatment ?

The cost or simplicity of a tooth extraction might seem attractive in comparison to having root canal treatment performed but this solution might not be the easiest or least expensive treatment choice in the long run.

When a tooth is missing its neighboring teeth will tend to shift, sometimes significantly. This in turn can have a major impact on your dental health. Even the removal of a single tooth can lead to problems related to your chewing ability, problems with your jaw joint, and predispose the teeth that have shifted to problems also.

To avoid these complications, in most cases your dentist will probably recommend to you that you have any tooth that has been extracted replaced. Replacing a tooth which has been extracted with an artificial one (using either a dental bridge, removable partial, or implant) can easily cost as much (and usually more) than ideal treatment for your tooth beginning with root canal therapy.



Don't make the decision to have a tooth extracted quickly. First, make sure that you and your dentist have discussed and explored all of the benefits and detriments of all of the treatment options that are available.

Timing your root canal treatment

In those cases where root canal therapy is needed it is always best to go ahead and make plans to have the treatment performed sooner rather than later. Sometimes, however, root canal treatment must be delayed because of scheduling conflicts, the need for other dental work, or else financial considerations. Delays such as these can usually be managed, at least to some degree. Often a dentist can perform the initial aspects of root canal treatment, the ones that can make it so your tooth feels better, and then schedule an appointment for you at a later date for the completion of the work.

You should not make a decision to delay root canal treatment unilaterally but instead discuss matters with your dentist. Any tooth that is in need of root canal treatment, but has not yet received it, is not predictable. A tooth could remain asymptomatic for an indefinite period of time or, at the other extreme, could abscess badly causing you pain and extensive swelling. Even in those cases where a tooth remains asymptomatic, the infection associated with the tooth could cause damage to the bone that surrounds it. Discuss matters with your dentist. Let them explain to you what they would consider a reasonable time frame for the treatment of your case.

How long will a tooth that has root canal treatment last ?

No doubt it is the hope of your dentist that the root canal treatment they provide for you will allow your tooth to last a lifetime. This can certainly be the case and hopefully the outcome you will experience.

What can cause root canal treatment to fail ?

Previously we described some of the goals of root canal treatment:

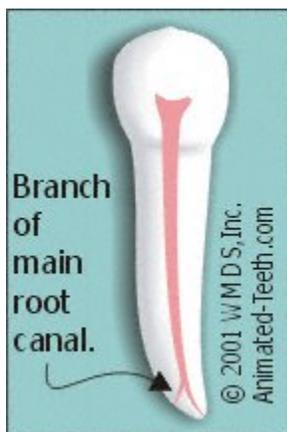
- ◆ It removes bacteria, toxins, unhealthy nerve tissue, and irritants that are currently present in a tooth.
- ◆ It fills in and seals off the nerve space inside a tooth so physically there is no location where bacteria and tissue irritants can exist and be out of effective reach of your body's defense mechanisms.

If after root canal treatment has been performed a tooth still harbors bacteria or irritants which keep the tissues surrounding the root of the tooth from being healthy (inflamed), then the treatment has not been successful. Some signs of failed root canal treatment can include tooth pain (ranging from very mild to extreme) and tenderness or swelling in the gums in the area near the tooth (ranging from very slight to pronounced). These signs can either:

- ◆ Persist from the time of the root canal treatment.
- ◆ Be transient (varying week to week or month to month).
- ◆ Appear even after years of the tooth being asymptomatic.

In other cases a tooth may have been, and continues to be, without symptoms but the tissues surrounding the tooth are identified as having the presence of persistent inflammation by way of a x-ray examination by a dentist.

In general, the presence of problems indicates that, despite your dentist's best efforts to clean and seal up the tooth, bacteria or tissue irritants have found some location in which to persist beyond the reach of your body's defense mechanisms. As a result there is the persistent presence of inflammation in the tissues which surround the tooth's root. Here are some of the reasons why this scenario might occur:



- ◆ The shape of any tooth's root canals can vary greatly. As an example, there can be root canals that have branches or forks in them. This branching can be hard for a dentist to discover and, as a result, one branch may be cleaned and sealed while the other branch is left untreated.
- ◆ A tooth may have more root canals than is normally anticipated. In these cases, especially when the unexpected root canals are very tiny, your dentist may not discover them and as a result not clean and seal them.
- ◆ here is a crack in the root of the tooth. These cracks can be very small or else in a location in which your dentist cannot detect them.

- ◆ The tooth has a defective or inadequate dental restoration and as a result bacteria have been able to seep past this restoration on into the inner aspects of the tooth and re-contaminate that area originally cleansed and sealed off by the root canal treatment.
- ◆ Even though a tooth has been expertly cleaned and sealed, with the passage of time the integrity of this seal can degrade, thus allowing bacteria to re-contaminate the interior aspects of the tooth.

Your dentist will have to evaluate your specific situation and advise you as to if they think the re-treatment of your tooth is likely to resolve your problems. They may offer to perform this re-treatment themselves or they may feel that the expertise of an endodontist is warranted for your case. If re-treatment is not a possibility then the tooth should be extracted.

Other problems that occur with teeth that have had root canal treatment

It is possible that your tooth's root canal treatment has been successful but the tooth itself has experienced problems which have severely compromised it.

- ◆ **The tooth has irreparably broken**
Teeth that have had root canal treatment are seldom as structurally strong as they once were. These teeth often require dental posts and crowns so to adequately strengthen and protect them.
- ◆ **The tooth has extensive decay or gum disease**
Teeth that have had root canal treatment are not impervious to tooth decay and gum disease, both of which can lead to the loss of the tooth. You must brush and floss your teeth effectively so to prevent the occurrence of these problems.