

# How to Treat a Cavity

When someone's tooth hurts, you do not always need to take it out. There may be a way to treat it and keep it. Always ask yourself whether a bad tooth really needs to come out.

This chapter is about treating cavities. Cavities are the holes that tooth decay makes in the teeth.



From this chapter, you can learn:

- how to decide which treatment to use for a cavity.
- how to use silver diamine fluoride (SDF).
- how to place a temporary cement filling.
- how to place a permanent filling using Atraumatic Restorative Treatment.

## WHICH TREATMENT TO USE

You can treat a cavity instead of taking out the tooth if the tooth does not have an abscess (an infection in the root, pages 93 to 94). There is probably not yet an abscess if:

- there is no swelling of the face or gums near the bad tooth.
- the tooth hurts only once in a while—for example, if it hurts only when eating or drinking something cold or sweet, or when breathing cold air.
- the tooth feels the same as the others when you tap it gently.



These signs mean the decay is deep enough for the nerve to feel temperature changes, but not deep enough for the nerve to be infected. **You can save the tooth by treating the cavity as soon as possible.**

To treat a cavity, you can:

- **put silver diamine fluoride (SDF) directly on the cavity** to stop decay and damage to the tooth.
- **place a temporary (cement) filling** meant to last only a few months. This helps the person feel more comfortable until they can get a permanent filling.
- **place a permanent filling** meant to last for many years. A permanent filling is done by a trained dental worker using either Atraumatic Restorative Treatment (pages 152 to 155) or a dental drill and a combination of materials called amalgam or composite (pages 156 to 157).

Which treatment you use depends on several things:

- Is the cavity on a baby tooth or a permanent tooth?
- Where on the tooth is the cavity?
- How deep and severe is the cavity?

When a cavity is on a baby tooth, is on the root of a tooth, or is small and not very deep, this is a good time to use SDF alone without placing a filling. For cavities on permanent teeth that are deeper or more severe, using SDF and then also filling the cavity will be necessary.

If you think there is an abscess in the tooth, do not place a filling. A tooth with an abscess must be taken out (see the next chapter) unless you can give special nerve treatment (root canal treatment).

## TREATING A CAVITY WITH SILVER DIAMINE FLUORIDE (SDF)

Silver diamine fluoride (SDF) is a colorless liquid put on teeth with a small brush. The silver in SDF kills germs that cause a cavity, stopping tooth decay and preventing the cavity from getting worse. The fluoride in SDF slows tooth decay and also helps repair the damaged tooth.

SDF is painless and easy to use. It works well for children, for anyone who has difficulty sitting for a long time to get dental work, and for anyone who is fearful of needles and dental drills.

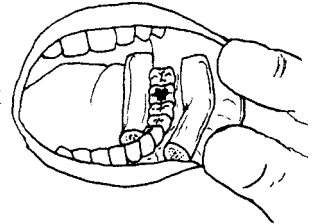
For cavities that are not severe or that are on baby teeth, treating with SDF is all that is needed. For cavities that are more severe or that are on permanent teeth, treating with SDF can be the first step before placing a permanent filling using Atraumatic Restorative Treatment (see pages 152 to 155).

**Note:** SDF will darken cavities after treatment. The person may also notice a bitter or metallic taste in their mouth right after treatment. If SDF is spilled on clothing or surfaces, it will cause a permanent stain.

**To treat a cavity with SDF, follow these 5 steps:**

1. Dry the cavity and keep it dry.
2. Put SDF on the cavity until it stays wet.
3. Wait 10 seconds.
4. Remove any excess SDF.
5. Protect the cavity from saliva for 1 minute.

**1. Dry the cavity and keep it dry.** The cavity and the area around it must be dry so you can see what you are doing and so the SDF will be absorbed. Place cotton between the cheek and gums to keep the area dry. Put some cotton under the tongue when you work on a lower tooth.



2. **Put 38% silver diamine fluoride solution directly on the cavity.** The cavity will absorb it. Put more SDF on the cavity every 5 to 10 seconds until the entire cavity stays wet.
3. **Wait 10 seconds** for the SDF to absorb into the cavity. Do not rinse the tooth or dry it with cotton or air.
4. **After 10 seconds, remove any excess SDF from the cavity** with cotton. The cavity should look moist when you are finished.
5. **Protect the cavity from saliva for 1 minute more** before removing the cotton from the person's mouth.

If the cavity is in a permanent tooth and is deep or severe, you may need to place a permanent filling by Atraumatic Restorative Treatment after treating with SDF. See pages 152 to 155.

## PLACING A FILLING

For a deeper or more severe cavity in a permanent tooth, a filling can help in several ways:

- It stops food, air, and water from touching the cavity. This will prevent much discomfort and pain.
- It stops the decay from going deeper. This can prevent a tooth abscess.
- It can help save the tooth, so the person can use it for many more years.

This chapter shows how to place cement fillings first and then explains how to place permanent fillings using Atraumatic Restorative Treatment. It does not explain how to use a dental drill. Have an experienced dentist train you to use a dental drill if you need to learn how.

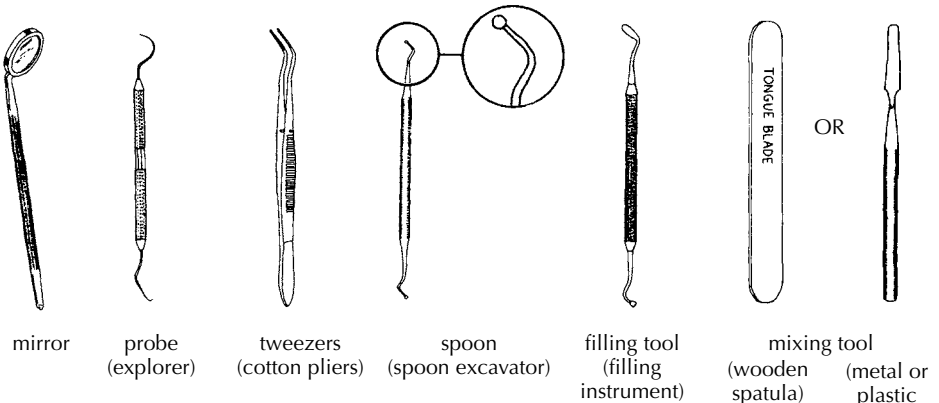
## Temporary (Cement) Fillings

If you do not have SDF, you can place a temporary cement filling while someone is waiting for a permanent filling. This can provide relief until the permanent filling can be placed.

In some places, government medical stores can provide most of the instruments as well as cement filling material. If this is not possible, a dentist may be able to help you to order what you need.

### Instruments

Many dental instruments look similar, but the small end of each instrument is shaped to do a special task. Try to get as many of these as you can and keep them in a kit.



Some instruments have more than one name.

The second one, in parentheses ( ), is the proper name.

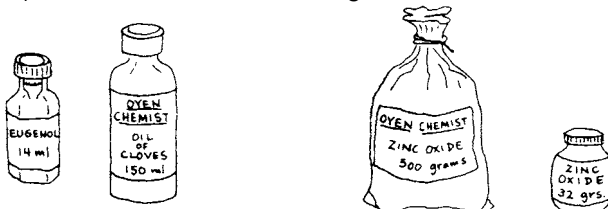
Use the proper name when you order.

mixing tool  
(wooden spatula for cement only)  
OR  
(metal or plastic spatula for cement or Atraumatic Restorative Treatment)

### Cement filling material

Many companies make temporary filling material. The names on the packages are different. This makes it hard to know which one to order.

However, the basic material of each product is the same—zinc oxide and oil of cloves (eugenol). To save money, order these two main ingredients in bulk instead of an expensive dental cement filling material.



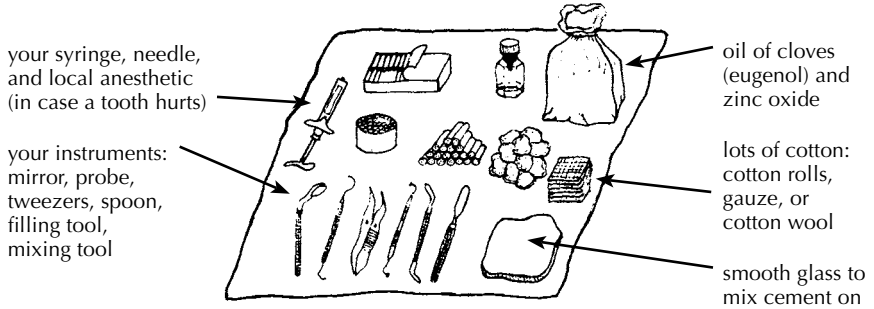
Oil of cloves is a liquid.

Zinc oxide is a powder.

You may be able to buy a special kind of zinc oxide powder called **IRM**. (Intermediate **R**estorative **M**aterial). Fillings with IRM are stronger and harder, so they last longer. But it is more expensive than zinc oxide and eugenol.

### How to place the cement filling

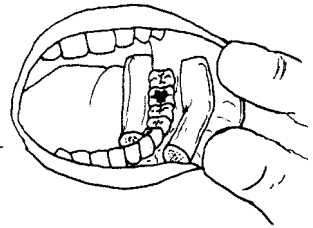
Lay out on a clean cloth:



**To place a cement filling, follow these 5 steps** (pages 147 to 150):

1. Dry the cavity and keep it dry.
2. Lift out the soft decay.
3. Mix the cement.
4. Press the cement into the cavity.
5. Remove the extra cement from around the cavity and the tooth.

**1. Dry the cavity and keep it dry.** The cavity and the area around it must be dry so you can see what you are doing. Just as important, **cement lasts longer inside a dry cavity.** Place cotton between the cheek and gums to keep the area dry. Put some cotton under the tongue when you work on a lower tooth.

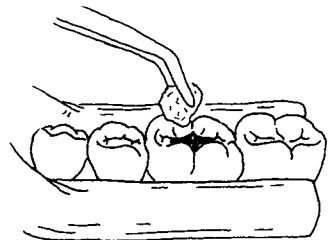


Use whatever kind of cotton you have: gauze, wool, or even rolls.

**Change the cotton whenever it becomes wet.**

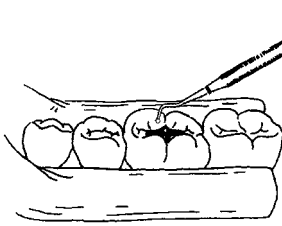
Keep the cavity dry while you work. Wipe the inside of it every now and then with a bit of cotton.

Leave a piece of cotton inside the cavity while you mix the cement.

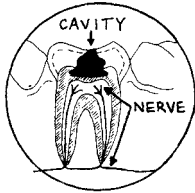


- 2. Lift out the decay.** You do not need to remove all of the decay on the bottom of the cavity. If you try to clean out all of the decay, you might touch the nerve.

**However, you must remove all of the decay from the edges of the cavity.** Otherwise, germs and food can go between the cement and the cavity and keep the decay growing inside. For Atraumatic Restorative Treatment (pages 152 to 155), it is especially important to remove all the decay from the edges so the filling will stick well.



Use the spoon tool to scrape clean the walls and the edge of the cavity. If you find that some part of the tooth at the edge of the cavity is thin and weak, break it deliberately. That makes for stronger sides to hold onto the cement. You can use the end of your filling tool to break the edge but it is much easier with a dental hatchet, which is less likely to bend.

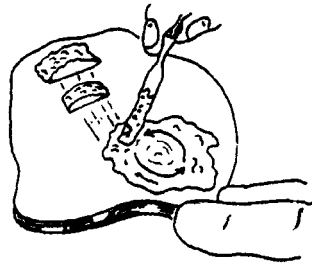
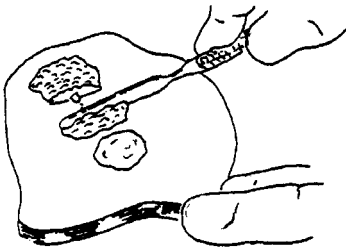


Use the spoon tool to lift out soft decay from inside the cavity. Be careful not to go too deep and touch the nerve at the very bottom of the cavity. This takes practice. If the tooth hurts when you do this, stop and inject some local anesthetic (page 137).

Use cotton gauze to collect the bits of decay so that the person does not swallow them. Use your mirror and look closely around the edges of the cavity for any decay that you may have missed. Put some cotton inside the cavity and leave it there to keep the area clean and dry while you mix the filling.

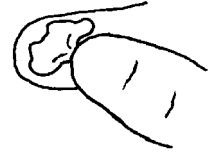
- 3. Mix the cement** on a piece of smooth glass. Place separately onto the glass a pile of zinc oxide powder and a few drops of eugenol liquid.

Pull a small amount of the powder to the liquid with the mixing tool and mix them together. Add more powder in this way, until the cement mixture becomes thick.



**Suggestion:** Practice mixing the cement ahead of time to learn how. This will also show you how much time it takes to harden.

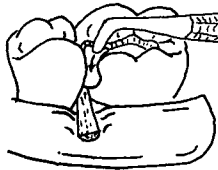
**Cement is much easier to use when it is thick but not too sticky.** Roll a bit between your gloved fingers. If the cement sticks, it is not yet ready. Add more powder and then test again.



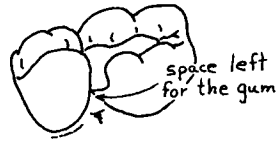
Now take the cotton out of the cavity. Make sure the cavity is dry. If the cotton around the tooth is wet, change it.

#### 4. Press some cement into the cavity.

If a cavity goes down between two teeth, you need to first take care that the cement does not squeeze and hurt the gum.



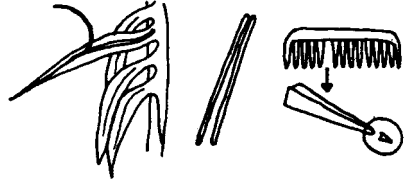
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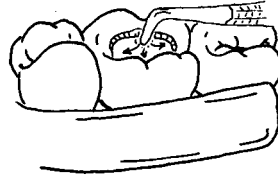
after

Before you apply the cement, place something thin between the teeth.

You can use the soft stem from a palm leaf, a toothpick, or a tooth from a comb. Be sure it has a rounded end to prevent damage to the gums.



To apply the cement, put a small ball of cement on the end of your filling tool. Carry it to the cavity. Spread it over the floor of the cavity and into the corners.



Then add another ball of cement, pressing it against the other cement and against the sides of the cavity.

**REMEMBER: Decay stops growing only when the cement covers it completely and tightly.**

Keep adding cement until the cavity is over-filled. Smooth the extra cement against the edge of the cavity.

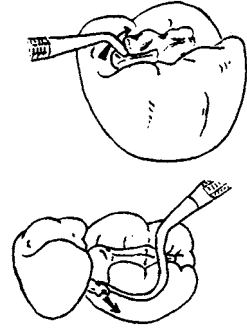
**5. Remove the extra cement before it gets too hard.** Press the flat side of the filling tool against the cement and smooth it towards the edge of the cavity.

As you smooth the cement, shape it to look like the top of a normal tooth. This way, the tooth above or below it can fit against the filling without breaking it.

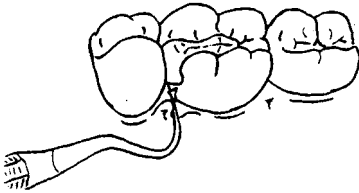
If you have placed something between the teeth (page 149), remove it and smooth the cement.

**Gums are easier to clean, and stay healthier, when the cement beside them is smooth.**

Cement that sticks out and is not smooth can hurt the gums. It can also later break off. When that happens, spit and germs are able to go inside and start the decay growing again.



**It is also important to look closely around the tooth for loose pieces of cement and to remove them before they make the gums sore.**



Use the end of your probe. Gently reach into the gum pocket and lift out any pieces of cement caught there.

Wipe off your probe with cotton gauze each time.

Now remove all the cotton and ask the person to gently close the teeth. The teeth should come together normally and not hit first against the cement filling. **Too much pressure against the cement filling will crack and break it.**

Always check to see if part of the filling is high:

- (1) If the cement is still wet, you can see the smooth place where the opposite tooth bit into it. Scrape the cement away from this place.
- (2) If the cement is dry, have the person bite on a piece of carbon paper. If there is too much cement, the carbon paper will darken the extra cement but not the surfaces of the nearby teeth. Scrape away the extra cement.



If you do not have carbon paper, darken some paper with a pencil.

**The person must not leave your clinic until the filled tooth fits properly against the other teeth.**



## After you place the filling

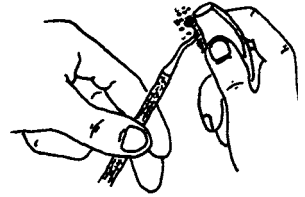
### Explain to the person how to take care of the filling so it will not break:

- Do not eat or drink anything for 1 hour—let the filling get hard and strong.
- Try not to use that tooth for biting or chewing after getting a cement filling. Until there is a permanent filling, the cement and sides of the cavity are weak. They cannot take much pressure.

If the tooth hurts more after you place the filling, and you have carefully fixed the bite, there is probably an abscess. Take out the tooth. If you cannot take out the tooth immediately because of swelling, take out the filling to relieve the pressure, and take out the tooth after you treat the swelling (page 93).

### Clean your instruments after you finish.

First scrape the dried cement from the tools. Then clean and disinfect them (see pages 87 and 89).



**REMEMBER: A cement filling is only a temporary measure.**

A good one can last up to 6 months. During this time, the person must see a dental worker who has the equipment to put in a permanent filling using Atruamatic Restorative Treatment (see the next page) or a dental drill. For this, the person may have to travel to a dental clinic or wait for a dental worker to visit your area.

## Permanent Fillings (Atraumatic Restorative Treatment)

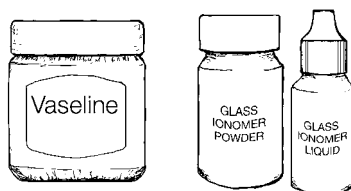
Atraumatic Restorative Treatment is a way to place a permanent filling without using an expensive dental drill. This method was invented in Tanzania, East Africa, and it is now being used by dental workers in many parts of the world.

Placing a permanent filling using this process is similar to placing a temporary cement filling, but instead of cement you use a sticky material called glass ionomer. Once glass ionomer is in the cavity, it releases fluoride (page 224) and helps prevent new cavities from forming.

### Instruments and filling material

The dental instruments you need for Atraumatic Restorative Treatment are the same as the ones for cement fillings shown on page 146. You will also need petroleum jelly (such as *Vaseline*) and a material called glass ionomer. Glass ionomer comes in “low viscosity,” “medium viscosity,” and “high viscosity” forms (“viscosity” describes how thick a liquid is). High viscosity glass ionomer works best because it is the strongest and lasts for a long time.

Glass ionomer used to be expensive, but now is not much more costly than other methods. A package of glass ionomer usually comes as a bottle of liquid and a bottle of powder that you mix together to use.



It is important to store glass ionomer in a cool place.

### How to place the permanent filling using Atraumatic Restorative Treatment

**To place a filling using Atraumatic Restorative Treatment follow these 6 steps:**

1. Dry the cavity and keep it dry (see page 147). This is important because the glass ionomer sticks much better to a dry cavity.
2. Lift out the soft decay (see page 148).
3. Clean the cavity (see page 153).
4. Mix the glass ionomer just before using it (see page 154).
5. Right away, fill the cavity with the glass ionomer (see pages 154 to 155).
6. Remove any extra glass ionomer from the tooth before it gets too hard (see page 155).

Follow steps 1 and 2 on pages 147 to 148. Then return here for steps 3 to 6.

To place a filling using Atraumatic Restorative Treatment after treating a cavity with SDF, follow only steps 3 to 6 here.

- 3. Clean the cavity.** After you have removed the decay, clean the cavity so that the glass ionomer will stick well. The best way to do this is with the liquid from the glass ionomer.

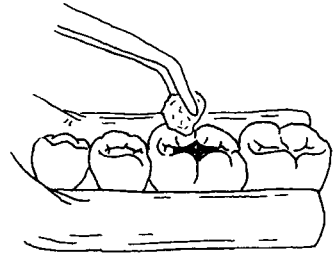
Put one drop of glass ionomer liquid on the glass slab. Using the tweezers, pick up a piece of cotton, dampen it in water, then dip it into the glass ionomer liquid. Use the cotton to clean the cavity.

Use another piece of cotton dipped only in water to wash the cavity out. Use a new piece of cotton to wipe out the cavity and dry it.

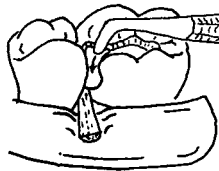
Put a piece of cotton inside the cavity while you mix the glass ionomer. This will keep the cavity dry.

If a cavity goes down between two teeth, one other step is necessary. You need to take care that the glass ionomer does not stick to the other tooth or squeeze and hurt the gum.

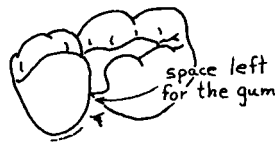
Before you mix the glass ionomer, place something thin between the teeth such as the soft stem from a palm leaf, a toothpick, or a tooth from a comb. A small strip of tin foil or a strip of plastic cut from a plastic bottle will also work. Be sure it has a rounded edge to prevent damage to the gums.



**Note:** Be sure that the glass ionomer liquid you are using has acid in it and is not just water. If your glass ionomer liquid is just water, clean the cavity with polyacrylic acid or cavity conditioner instead.



before



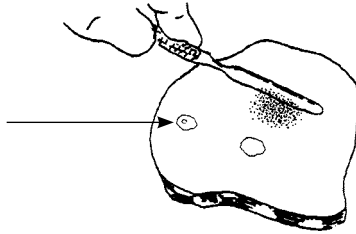
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**4. Mix the glass ionomer** on a piece of smooth glass just before using it.

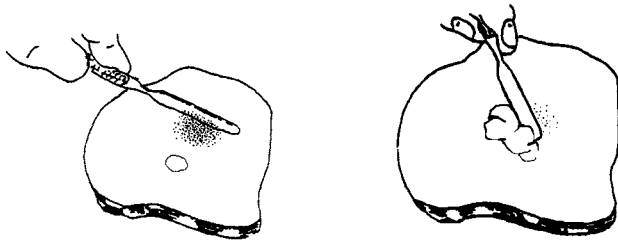
The package of glass ionomer should have a bottle of liquid, a bottle of powder, a measuring scoop, and instructions for how much to use of each. Place a level scoop of the powder onto the glass, then close the powder bottle right away.

Put a drop of liquid separately on the glass. Make sure the drop has no air bubbles in it. If it does, keep holding the bottle upside down and put a second drop somewhere else on the glass to use for mixing.

You can use a drop with air bubbles to clean the cavity for step 3.



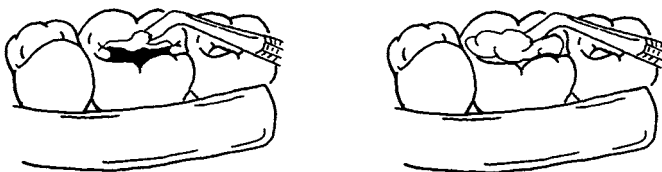
Spread the liquid around a little, pull half of the powder to the liquid with the mixing tool, and mix them together quickly and carefully. Add more powder until you have used the full amount instructed. Be sure to mix in all the powder and do not add extra liquid. This makes the filling strong. The mixture should become thick and smooth like chewing gum.



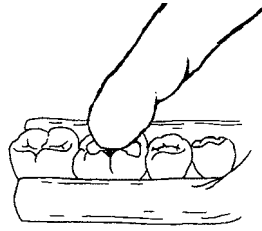
Now, take the cotton out from inside the cavity. Check to be sure the cavity is dry. If the cotton around the tooth is wet, change it.

**5. Fill the cavity with the glass ionomer** right away. Use your filling tool to carry a small amount of the glass ionomer mixture to the cavity.

Carefully press the mixture against the sides of the cavity. Then add more glass ionomer to fill the center of the cavity. Work quickly and carefully.



Keep adding glass ionomer until the cavity is over-filled. Put extra glass ionomer in any other pits on the surface of the tooth near the cavity. Rub petroleum jelly on your finger and press down firmly onto the filling for a few seconds, rolling your finger from side to side. This will smooth the top of the filling.



Remove your finger carefully from the side so you do not lift out the filling.

**6. Remove extra glass ionomer from the tooth before it gets too hard.** Use the spoon tool or the filling tool to quickly and carefully remove any loose pieces of glass ionomer.

Let the glass ionomer harden for less than 1 minute, then ask the person to gently close the teeth. The teeth should come together normally and not hit first against the filling.

Check to see if part of the filling is too high by having the person bite on a piece of carbon paper. If there is too much filling, the carbon paper will darken the extra filling but not the surfaces of the nearby teeth. Scrape away the extra filling from that place using the filling tool and check again.



If you do not have carbon paper, darken some paper with a pencil.

**The person must not leave your clinic until the filled tooth fits properly against the other teeth.**

Once the teeth fit together, spread petroleum jelly over the filling with your finger. Petroleum jelly will protect the filling from water and saliva for at least an hour while the filling fully hardens. Take out all the cotton.

After you have finished placing the filling, explain to the person how to take care of it. Clean and disinfect your instruments. See pages 87 and 89.

## Permanent Fillings Using A Dental Drill

This chapter has shown how to place a **temporary** filling with cement and a **permanent** filling with Atraumatic Restorative Treatment. This book does not give full instructions for placing permanent fillings with a dental drill, but if you have been trained to use a dental drill, see pages 217 and 221 to 222 for ideas about getting equipment and resources.

### Some simple dental drills

A dental drill can remove all decay from a cavity and change the shape of the hole in a tooth so it can firmly hold the permanent filling material. The most expensive drills use electricity, but some drills are powered by people instead of electricity.



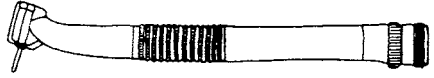
Village dental workers in the mountains of western Mexico use bicycle power to make compressed air, which runs a high-speed drill.

Local young people or family members volunteer to pump the air while they wait to have their own teeth fixed.



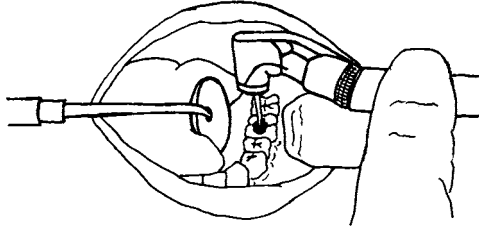
In India and Guatemala, health workers use a foot treadle to power a drill, the same way one can operate a sewing machine. This kind of drill is slower than a compressed-air drill, and the grinding produces a lot of heat, so one must take care not to let the tooth get so hot that it kills the nerves (see page 157). Still, this is one of the simplest and cheapest ways to place a permanent filling.

## How a dental drill works



Even if you have the equipment, **it is essential that you learn how to make permanent fillings from a person who has experience using a dental drill.**

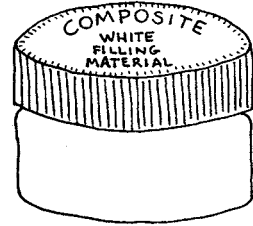
The tip of the drill (the drill bit) is sharp. Some drills spray water on the tooth to keep it cool. Cooling is especially important with a slower treadle-powered drill. An assistant can spray water on the tooth if the drill does not have a sprayer.



As the drill bit moves slowly back and forth, it opens the cavity further. This makes it easier to see all of the decay. The decay is later removed with a spoon tool (page 146).

The drill bit also changes the shape of the cavity. The hole in the tooth is shaped so that it will keep the permanent filling material in place.

The filling material, which is made of metal or plastic, must be very strong. It must not break apart when the person chews food or when saliva washes over it.



## Do Not Use Mercury Amalgam to Fill Teeth!

For many years, mercury—a shiny, silver-white metal—was used in health care to fill thermometers, blood pressure measuring devices, and as part of metal amalgam to fill teeth. But now the use of mercury has been banned in many countries because it is so toxic (poisonous) to people. Mercury can harm the brain, spinal cord, kidney, and liver, causing tremors (shakiness), sleeplessness, memory loss, headache, nervousness, stomach pain, vomiting, and diarrhea. It is especially harmful to a pregnant person and the developing baby.

Carefully read the descriptions of the filling material you use to make sure it does not contain mercury. Other materials, such as composite, glass ionomer, ceramics, etc. may be just as available, affordable, and effective. And they are much safer for you, your patients, and the environment.

# Where There Is No Dentist 2024