

What is dental amalgam?



Dental amalgam is a dental filling material used to fill cavities caused by tooth decay. It has been used for more than 150 years in hundreds of millions of patients around the world.

Dental amalgam is a mixture of metals, consisting of liquid (elemental) mercury and a powdered alloy composed of silver, tin, and copper. Approximately 50% of dental amalgam is elemental mercury by weight. The chemical properties of elemental mercury allow it to react with and bind together the silver/copper/tin alloy particles to form an amalgam.

Dental amalgam fillings are also known as “silver fillings” because of their silver-like appearance. Despite the name, “silver fillings” do contain elemental mercury.



When placing dental amalgam, the dentist first drills the tooth to remove the decay and then shapes the tooth cavity for placement of the amalgam filling. Next, under appropriate safety conditions, the dentist mixes the powdered alloy with the liquid mercury to form an amalgam putty. (These components are provided to the dentist in a capsule as shown in the graphic.) This softened amalgam putty is placed and shaped in the prepared cavity, where it rapidly hardens into a solid filling.

What should I know before getting a dental amalgam filling? Deciding what filling material to use to treat dental decay is a choice that must be made by you and your dentist.

FDA continues to evaluate the available information on dental amalgam, and will update the information on this web page as necessary. As you consider your options, you should keep in mind the following information.

Benefits: Dental amalgam fillings are strong and long-lasting, so they are less likely to break than some other types of fillings.

Dental amalgam is the least expensive type of filling material.

Potential Risks: Dental amalgam contains elemental mercury. It releases low levels of mercury in the form of a vapor that can be inhaled and absorbed by the lungs. High levels of mercury vapor exposure are associated with adverse effects in the brain and the kidneys.

FDA has reviewed the best available scientific evidence to determine whether the low levels of mercury vapor associated with dental amalgam fillings are a cause for concern. Based on this evidence, FDA considers dental amalgam fillings safe for adults and children ages 6 and above. The weight of credible scientific evidence reviewed by FDA does not establish an association between dental amalgam use and adverse health effects in the general population. Clinical studies in adults and children ages 6 and above have found no link between dental amalgam fillings and health problems.

The developing neurological systems in fetuses and young children may be more sensitive to the neurotoxic effects of mercury vapor. Very limited to no clinical data is available regarding long-term health outcomes in

pregnant women and their developing fetuses, and children under the age of six, including infants who are breastfed. Pregnant women and parents with children under six who are concerned about the absence of clinical data as to long-term health outcomes should talk to their dentist.

However, the estimated amount of mercury in breast milk attributable to dental amalgam is low and falls well below general levels for oral intake that the Environmental Protection Agency (EPA) considers safe. Despite the limited clinical information, FDA concludes that the existing risk information supports a finding that infants are not at risk for adverse health effects from the mercury in breast milk of women exposed to mercury vapor from dental amalgam. Some individuals have an allergy or sensitivity to mercury or the other components of dental amalgam (such as silver, copper, or tin). Dental amalgam might cause these individuals to develop oral lesions or other contact reactions. If you are allergic to any of the metals in dental amalgam, you should not get amalgam fillings. You can discuss other treatment options with your dentist.

Why is mercury used in dental amalgam? Approximately half of a dental amalgam filling is liquid mercury and the other half is a powdered alloy of silver, tin, and copper. Mercury is used to bind the alloy particles together into a strong, durable, and solid filling. Mercury's unique properties (it is a liquid at room temperature and that bonds well with the alloy powder) make it an important component of dental amalgam that contributes to its durability.

What is bioaccumulation? Bioaccumulation refers to the build-up or steadily increasing concentration of a chemical in organs or tissues in the body. Mercury from dental amalgam and other sources (e.g., fish) is bioaccumulative. Studies of healthy subjects with amalgam fillings have shown that mercury from exposure to mercury vapor bioaccumulates in certain tissues of the body including kidneys and brain. Studies have not shown that bioaccumulation of mercury from dental amalgam results in damage to target organs.

Is the mercury in dental amalgam the same as the mercury in some types of fish? No. There are several different chemical forms of mercury: elemental mercury, inorganic mercury, and methyl mercury. The form of mercury associated with dental amalgam is elemental mercury, which releases mercury vapor. The form of mercury found in fish is methyl mercury, a type of organic mercury. Mercury vapor is mainly absorbed by the lungs. Methyl mercury is mainly absorbed through the digestive tract. The body processes these forms of mercury differently and has different levels of tolerance for mercury vapor and methyl mercury.

If I am concerned about the mercury in dental amalgam, should I have my fillings removed? If your fillings are in good condition and there is no decay beneath the filling, FDA does not recommend that you have your amalgam fillings removed or replaced. Removing sound amalgam fillings results in unnecessary loss of healthy tooth structure, and exposes you to additional mercury vapor released during the removal process.

However, if you believe you have an allergy or sensitivity to mercury or any of the other metals in dental amalgam (such as silver, tin, or copper), you should discuss treatment options with your dentist.