



Division of Oral Health

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Dental Amalgam Use and Benefits

Amalgam is one of the most commonly used tooth fillings. It is a safe, sound, and effective treatment for tooth decay.

Amalgam has been the most widely used tooth filling material for decades. It remains popular because it is strong, lasting and low-cost.

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How Amalgam Is Made

Amalgam is made by blending almost equal parts of elemental liquid mercury and an alloy powder of mostly silver, and some tin and copper. Smaller amounts of other metals are sometimes used.

1. First, the dentist removes decay and prepares the tooth for the filling.
2. Second, the dentist mixes the mercury and metal powders together to form a putty-like substance.
3. Third, the dentist places the substance into the tooth and carves it to replace the part of the tooth destroyed by decay.
4. Last, the matter hardens fast and typically provides many years of normal function.

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Safety Concerns

The mercury found in amalgam fillings has raised some safety concerns over the years. Amalgam can release small amounts of mercury vapor over time. Patients can absorb these vapors by inhaling or ingesting them.

People can also be exposed to mercury through other means. Exposure can happen through certain foods (particularly fish), medications, the air we breathe, and other sources.

Mercury toxicity from high-level industrial or work exposure has been demonstrated. Possible symptoms of mercury poisoning include irritability, memory loss, tremors, poor physical coordination, insomnia, kidney failure, and anorexia.

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Little Evidence of Any Health Risk

Reports that suggest mercury from amalgam causes the above-mentioned symptoms, conditions and other diseases like Alzheimer's or multiple sclerosis, are not backed up by current [scientific evidence](#).* The evidence also suggests that the removal of amalgam has no health benefits.

Scientists supported by the National Institute of Dental and Craniofacial Research (NIDCR) recently reported the results of [two randomized clinical trials](#) that weighed the safety of placing amalgam fillings in the teeth of children. NIDCR is part of the National Institutes of Health (NIH).

One study was conducted in the United States and the other in Europe. The results are published in *JAMA (Journal of the American Medical Association)*.

Both studies separately reach the same conclusion. Children whose cavities are filled with dental amalgam have no harmful health effects.

The findings include no detectable loss of intellect, memory, coordination, focus, nerve conduction, or kidney function during the 5 to 7 years the children were followed. Prior work studies with adults indicate these organs might be especially sensitive to mercury.

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Amalgam Use is Declining

Amalgam use is declining for several reasons. The main reason is that cavity rates among school children and young adults are dropping. Improved filling alternatives are also now available for certain uses.

[Community water fluoridation](#), [fluoride products](#), and [sealants](#) have played large roles in tooth decay decline. Other factors include changes in eating behavior and improvements in oral hygiene products and practices.

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Dental amalgam is used—

- In persons of all ages.
- In areas where most chewing is done, mainly in the rear teeth.
- When there is severe damage of tooth structure and cost is a big factor.
- As a foundation for metal, metal-ceramic, and ceramic crowns or caps.
- When patient commitment to personal oral hygiene is poor.
- When moisture control is a problem when placing the filling.
- When cost is a large patient concern.

Dental amalgam is not used when—

- Looks are important, such as fillings in the front teeth.
- Patients have a history of allergy to mercury or other amalgam parts.
- A large filling is needed and the cost of other restorative materials is not a major factor in the treatment decision.

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Ongoing Research and Regulatory Activities

The U.S. Public Health Service (USPHS) through the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA), reported on the risks and benefits of dental amalgam in 1993. Since, it has periodically examined the peer-reviewed scientific literature to judge the safety and effectiveness of amalgam and to update the public.

A recent [review](#)* conducted for the USPHS in 2004 found “insufficient evidence of a link between dental mercury and health problems, except in rare instances of allergic reaction.”

The Food and Drug Administration recently reviewed the scientific evidence on the safe use of amalgam and in July 2009 classified encapsulated dental amalgam as a class II medical device, the same as other commonly used dental restorative materials such as composite and gold. In its reclassification statement, the FDA discusses the scientific evidence on the benefits and risk of dental amalgam, including the risks of inhaled mercury vapor. The statement will help dentists and patients make informed decisions about the use of dental amalgam. Read the [FDA reclassification statement here](#).

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Related Links

- [FDA Information on Dental Amalgams](#)
- [Life Sciences Research Office \(LSRO\) Amalgam Report Press Release*](#)  (PDF--24K)
- [LSRO Amalgam Report Executive Summary*](#)

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One or more documents on this Web page is available in Portable Document Format (PDF). You will need [Acrobat Reader](#) to view and print these documents.

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