

Kristine Byrum

History of dental amalgam

SILVER FILLINGS. That is what patients commonly call an amalgam restoration. However, “silver filling” does not correctly explain the materials in amalgam restorations.

In general, amalgam means a mixture or a blend of anything. Dental amalgam, specifically, is a mixture of metals: half liquid (elemental) mercury and half a powdered alloy containing silver, tin, and copper.

When a dentist is ready to fill a cavity with amalgam, encapsulated powdered alloy mixes with liquid mercury to form a softened amalgam putty. The putty is placed and shaped into the prepared cavity and then hardens rapidly to become a strong, solid filling for the patient.

Dental amalgams have been used for nearly 200 years, but not without controversy.

A French dentist’s discovery

In 1816, French dentist August Taveau developed a dental amalgam containing melted silver coins and a small amount of mercury. In 1826, Taveau used his amalgam clinically as a dental restorative material. Unfortunately, Taveau’s amalgam tended to significantly expand after the material set.

Although Taveau’s dental amalgam wasn’t a perfect restorative material, it offered a lower-cost, easier technique compared to other available restorative materials of the time like gold.

In 1833, Edward Crawcour and his nephew, Moses Crawcour, introduced dental amalgam in the United States, marketing it as a new material to fill teeth in New York. However, after a chemist tested a Crawcour amalgam filling and discovered that hydrargyrum (mercury or then known as “quicksilver”) was an ingredient, many called for the Crawcours’ arrest. This prompted dental amalgam’s rapid departure from the state, although the Crawcours had already filled the teeth of half the adults in New York.

While the proportions of metals in the material have changed since the 1800s, dental amalgam is still considered a less expensive and easily manipulated material compared to other restorative material options. Concerns over its safety persists, though, because it includes mercury among its ingredients.

The amalgam debate

Since its introduction in dentistry as a restorative material, amalgam has been controversial among providers and its use continues to be debated.

When the American Dental Association formed, it did not issue an official position on the safety of dental amalgam. At that time, efforts were placed into developing better amalgam as a restorative material. During the late 1870s, a pro-amalgam movement began to promote its safe and valuable use as a restorative material in dentistry. In 1895, the ADA officially expressed its support for using amalgam in dentistry, a position ADA maintains today.

Despite the ADA voicing its support of dental amalgam, groups opposing its use throughout the 20th century tried to link dental amalgam with numerous illnesses. Overall, amalgam was considered safe until methods developed in the 1980s confirmed the steady release of mercury vapors from amalgam fillings.

In December 1990, a “60 Minutes” episode suggested potential connections between multiple sclerosis and amalgam poisoning, reigniting the amalgam debate. Even though no scientific studies proved amalgam unsafe or connected to any chronic disease, many patients demanded that dentists replace their amalgam fillings. Some dentists refused to fulfill their patients requests while others complied, replacing amalgam fillings with resin.

This ongoing issue prompted the ADA to revise its Principles of Ethics and Code of Professional Conduct to state: *“The removal of amalgam restorations from the non-allergic patient for the alleged purpose of removing toxic substances from the body, when such treatment is performed solely at the recommendation or suggestion of the dentist is improper and unethical.”*



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Dental amalgam recommendations for dentists and patients

While dental amalgam is deemed safe, the ADA supports continued research on amalgam and all types of filling materials. The organization pledged to “promptly inform the public if the scientific community and government regulatory bodies determined that any cavity filling material was unsafe for patients.”

The ADA encourages patients to discuss treatment options with their dentist and voice concerns about materials with which they are uncomfortable.

Although composite resins are commonly used because of its bonding and esthetic properties, dentists still use dental amalgam for patients with a high risk for cavities, large posterior fillings where occlusal forces are higher, and in areas where moisture control can present problems for other restorative materials at or below the gum line.

While amalgam is considered safe for the general population, the U.S. Food and Drug Administration recognizes certain people have a greater risk of experiencing harmful health effects from mercury vapor released from the fillings. It recommends the following people avoid dental amalgam fillings:

1. Pregnant women and their developing fetuses
2. Women who plan to become pregnant
3. Nursing women and their newborn infants
4. Children, especially younger than age 6
5. People with pre-existing neurological diseases like multiple sclerosis, Alzheimer’s disease, or Parkinson’s disease
6. People with impaired kidney functions
7. People with heightened sensitivity or who are allergic to mercury or other components of dental amalgam

The FDA and the ADA do not recommend anyone remove or replace existing amalgam restorations that are in good condition unless considered medically necessary by a health care professional. Also, there is no available scientific evidence to support a complete ban of dental amalgam use.

Overall, dental amalgam is longer-lasting, less likely to fracture, and less expensive than other available filling material. It has been used for more than 150 years in hundreds of millions of patients world-wide. As with anything in dentistry, it is important for patients to consult with their dentist when choosing the best filling material for their situation.

KRISTINE BYRUM