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BEST MANAGEMENT PRACTICES FOR AMALGAM WASTE

American Dental Association

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Dental Amalgam Waste

Dental amalgam waste can be recycled to help prevent the release of mercury to the environment. Following the simple suggestions outlined in this document will help protect the environment.

Concern about the effects of mercury in the environment has increased over the years. Mercury in the environment is bioaccumulative, which means that it can build up in fish and cause health problems in humans and other animals that eat fish. Many state health professionals recommend limiting fish consumption, especially for children and pregnant women.

Mercury is a naturally occurring metal; however, about half of the mercury released to the environment comes from human activity. Of that amount, 53% is emitted from combustion of fuels for energy production and 34% is from the combustion of waste.[1] Sources associated with manufacturers and consumers make up the remaining 13%, with dentistry contributing less than one percent.

Some mercury released into the air eventually collects in the waterways, where it enters the food chain. As a precautionary measure, U.S. regulators typically assume that all or most of the mercury released into the air or surface water may accumulate in fish. According to the EPA in 2000, metals (mainly due to the detection of mercury in fish tissue samples) were the second most common pollutant impairing 3.2 million acres of the 17.3 million acres of assessed lakes (the assessed lakes comprised 43% of the total lake acres).[2]

Although mercury in the form of dental amalgam is stable, amalgam should ***not*** be disposed of in the garbage, infectious waste "red bag," or sharps container. Amalgam also should ***not*** be rinsed down the drain. These cautions are important because some communities incinerate municipal garbage, medical waste, and sludge from wastewater treatment plants. If amalgam waste ends up in one of these incinerated waste streams, the mercury can be released to the environment due to the high temperatures used in the incineration process. Increasingly, local communities are enacting restrictions on the incineration of wastes containing mercury.

The good news is that amalgam waste, kept separate from other waste, can be safely recycled. The mercury can be recovered from amalgam wastes through a distillation process and reused in new products. The ADA strongly recommends recycling as a best management practice for dental offices.

The following information demonstrates how to manage and recycle dental amalgam waste to help protect the environment.

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[1] Office of Air Quality Planning and Standards, Office of Research and Development. Mercury Study Report to Congress. Volume II: An inventory of anthropogenic mercury emissions in the United States. Washington, D.C.: Environmental Protection Agency. Publication No. EPA-452/R-97-004. December 1997, p. ES-6.

[2] EPA. Quality of America's Lakes. http://www.epa.gov/owow/lakes/quality.html (accessed April 2007).

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Glossary of Amalgam Waste Terms

- **Amalgam capture device** is an apparatus such as a chair side trap, vacuum pump filter or amalgam separator that collects amalgam particles.
- **Amalgam sludge** is a mixture of liquid and solid material that collects within vacuum pump filters, amalgam separators or other amalgam capture devices that may be used.
- **Contact amalgam** is amalgam that has been in contact with the patient. Examples are extracted teeth with amalgam restorations, carving scrap collected at chair side, and amalgam captured by chair side traps, filters, or screens.
- **Dental Best Management Practices** are a series of amalgam waste handling and disposal practices that include, but are not limited to, initiating bulk mercury collection programs, using chair side traps, amalgam separators compliant with ISO 11143[3] and vacuum collection, inspecting and cleaning traps, and recycling or using a commercial waste disposal service to dispose of the amalgam collected.
- **Empty amalgam capsules** are the individually dosed containers left over after mixing precapsulated dental amalgam.
- **Non-contact amalgam (scrap)** is excess mix leftover at the end of a dental procedure.

The ADA recommends against the use of bulk elemental mercury, also referred to as liquid or raw mercury, for use in the dental office. Since 1984, the ADA has recommended use of precapsulated amalgam alloy.

If you still have bulk elemental mercury in the office, you should recycle it. Check with a licensed recycler to determine whether they will accept bulk mercury. ***Do not*** pour bulk elemental mercury waste in the garbage, red bag or down the drain. You also should check with your state regulatory agency and municipality to find out if a bulk mercury collection program is available. Such bulk mercury collection programs provide an easy way to dispose of bulk mercury.

Steps for Recycling Amalgam Waste

1. Stock amalgam capsules in a variety of sizes to minimize the amount of amalgam waste generated.
2. Amalgam waste may be mixed with body fluids, such as saliva, or other potentially infectious material, so use personal protective equipment such as utility gloves, masks, and protective eyewear when handling it.
3. Contact an amalgam waste recycler about any special requirements that may exist in your area for collecting, storing and transporting amalgam waste.

[3] International Standards Organization 11143:1999. Dental Equipment – Amalgam Separators.

If you need to find a recycler, check with your city, county or local waste authority to see whether they have an amalgam waste recycling program.

4. Store amalgam waste in a covered plastic container labeled "Amalgam for Recycling" or as directed by your recycler. Your recycler may have its own requirements, so ask your recycler about containers and what may be placed in them.
5. Look for recyclers who comply with the ADA-ANSI standard. This standard is meant to encourage recycling.

Questions to Ask Your Amalgam Waste Recycler

Below is a list of questions you may want to ask your amalgam waste recycler. Note that not all recycling companies accept every type of amalgam waste, and the services offered by recyclers vary widely. The ADA recommends that you contact a recycler before recovering amalgam and ask about any specific handling instructions the recycler may have. Importantly, select a reputable company that complies with applicable federal and state law and provides adequate indemnification for its acts and omissions. Look for recyclers who comply with ANSI/ADA Specification 109: Procedures for Storing Dental Amalgam Waste and Requirements for Amalgam Waste Storage/Shipment Containers.[3] This standard is meant to encourage recycling.

Ask Your Recycler …

- What kind of amalgam waste do you accept?
- Do your services include pick up of amalgam waste from dental offices? If not, can amalgam waste be shipped to you?
- Do you provide packaging for storage, pick up or shipping of amalgam waste?
- If packaging is not provided, how should the waste be packaged?
- What types of waste can be packaged together?
- Do you accept whole filters from the vacuum pump for recycling?
- Is disinfection required for amalgam waste?
- How much do your services cost?
- Do you pay for clean non-contact amalgam (scrap)?
- Do you accept extracted teeth with amalgam restorations?
- Does your company have an EPA or applicable state license?
- Does the company use the proper forms required by the EPA and state agencies?
- Do your procedures comply with ANSI/ADA Specification 109: Procedures for Storing Dental Amalgam Waste and Requirements for Amalgam Waste Storage/Shipment Containers?[4]

[4]American Dental Association Council on Scientific Affairs. American National Standard/American Dental Association Specification No. 109. Procedures for storing dental amalgam waste and requirements for amalgam waste storage/shipment containers, 2006.

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Best Management Practices for Amalgam Waste

DO	DON'T
Do use precapsulated alloys and stock a variety of capsule sizes	***Don't*** use bulk mercury
Do recycle used disposable amalgam capsules	***Don't*** put used disposable amalgam capsules in biohazard containers, infectious waste containers (red bags) or regular garbage
Do salvage, store and recycle non-contact amalgam (scrap amalgam)	***Don't*** put non-contact amalgam waste in biohazard containers, infectious waste containers (red bags) or regular garbage
Do salvage (contact) amalgam pieces from restorations after removal and recycle the amalgam waste	***Don't*** put contact amalgam waste in biohazard containers, infectious waste containers (red bags) or regular garbage
Do use chair-side traps, vacuum pump filters and amalgam separators to retain amalgam and recycle their contents.	***Don't*** rinse devices containing amalgam over drains or sinks
Do recycle teeth that contain amalgam restorations. (*Note:* Ask your recycler whether or not extracted teeth with amalgam restorations require disinfection)	***Don't*** dispose of extracted teeth that contain amalgam restorations in biohazard containers, infectious waste containers (red bags), sharps containers or regular garbage
Do manage amalgam waste through recycling as much as possible	***Don't*** flush amalgam waste down the drain or toilet
Do use line cleaners that minimize dissolution of amalgam	***Don't*** use bleach or chlorine-containing cleaners to flush wastewater lines

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Practical Guide to Integrating BMPs Into Your Practice

Non-contact (scrap) amalgam
• Place non-contact, scrap amalgam in wide-mouthed, container that is marked "Non-contact Amalgam Waste for Recycling." • Make sure the container lid is well sealed. • When the container is full, send it to a recycler.
Amalgam capsules
• Stock amalgam capsules in a variety of sizes. • After mixing amalgam, place the empty capsules in a wide-mouthed, airtight container that is marked "Amalgam Capsule Waste for Recycling." • Capsules that cannot be emptied should likewise be placed in a wide-mouthed, airtight container that is marked "Amalgam Capsule Waste for Recycling." • Make sure the container lid is well sealed. • When the container is full, send it to a recycler.
Disposable chair-side traps
• Open the chair-side unit to expose the trap. • Remove the trap and place it directly into a wide-mouthed, airtight container that is marked "Contact Amalgam Waste for Recycling." • Make sure the container lid is well sealed. • When the container is full, send it to a recycler. • Traps from dental units dedicated strictly to hygiene may be placed in with the regular garbage.
Reusable chair-side traps
• Open the chair-side unit to expose the trap. • Remove the trap and empty the contents into a wide-mouthed, airtight container that is marked "Contact Amalgam Waste for Recycling." • Make sure the container lid is well sealed. • When the container is full, send it to a recycler. • Replace the trap into the chair-side unit (Do ***not*** rinse the trap under running water as this could introduce dental amalgam into the waste stream.
Vacuum pump filters
• Change the filter according to the manufacturer's recommended schedule. *Note:* The following instructions assume that your recycler will accept whole filters; some recyclers require different handling of this material, so check with your recycler first. • Remove the filter. • Put the lid on the filter and place the sealed container in the box in which it was originally shipped. When the box is full, the filters should be recycled.
Amalgam separators
• Select an amalgam separator that complies with ISO 11143. • Follow the manufacturer's recommendations for maintenance and recycling procedures.
Line cleaners
• Use non-bleach, non-chlorine–containing line cleaners, which will minimize amalgam dissolution, such as those listed in the ***Additional Resources*** section of this document.

Additional Resources

The following articles published in the *Journal of the American Dental Association* are available through the ADA Division of Science and also are available to ADA members online.

For information on proper mercury hygiene practices see "Dental Mercury Hygiene Recommendations". 2003:134(11);1498-9.

For information on choosing line cleaners that minimize the dissolution of mercury from amalgam see: "The effect of disinfectants and line cleaners on the release of mercury from amalgam" 2006:137(10);1419-25.

For information on amalgam separators see:

- "Laboratory evaluation of amalgam separators" 2002:133;577-89.
- "Evaluating amalgam separators using an international standard" 2006:137;999-1005.
- "Purchasing, installing and operating dental amalgam separators: Practical issues" 2003 134: 1054-65.