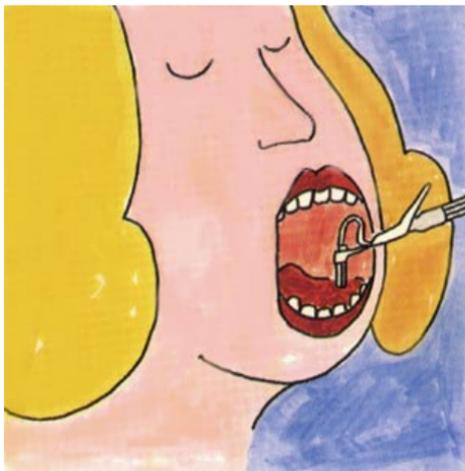


Dentistry *and the* Environment



**A Guidance Document Developed to
Increase Dentist's Awareness of the
Environmental
Impacts of Wastes from Dental Facilities**

**HOW DENTISTS CAN HELP PROTECT
BOSTON HARBOR AND THE ENVIRONMENT**

MASSACHUSETTS WATER
RESOURCES AUTHORITY



MASSACHUSETTS DENTAL
SOCIETY



January, 1998

This brochure is designed to assist dentists in recycling and reducing the wastes disposed of from their offices.



MWRA operates sewage treatment facilities for 43 cities and towns whose sewerage discharges into Boston Harbor, and is responsible for minimizing the release of toxic substances into its sewer system.

Wastes from dental offices may include toxics such as:

- ▶ Amalgam scrap containing mercury and silver
- ▶ Scrap from zinc-based cements
- ▶ X-ray fixer solution containing silver
- ▶ X-ray developer

The Massachusetts Department of Environmental Protection (DEP) and EPA's New England Region are responsible for air and water pollution throughout the state. Discharges from dental facilities are currently not regulated by EPA, DEP or MWRA. These agencies are promoting voluntary pollution prevention and recycling in dental offices in order to minimize releases of regulated substances into sewer systems or ordinary trash.

Pollution prevention practices are intended to control or reduce wastes at their sources.

This brochure recommends some measures that dentists may take to reduce discharges of mercury and other pollutants. None of the measures described are required by regulation, but all can help in relieving the harmful release of toxics to the environment.



The Massachusetts Dental Society encourages its members to use the practices endorsed in this brochure. Although approximately 65% of dentists already recycle amalgam, MDS hopes to increase this percentage significantly.

MDS has a recommended licensed waste transporter that will take scrap amalgam.

Let us know about your experiences with recycling and on recycling companies and transporters you have worked with.

For information on recycling, contact:

Karen Rafeld
Massachusetts Dental Society
83 Speen Street
Natick, MA 01760-4144
508-651-7511

For information on toxics reduction, contact:

Massachusetts Water Resources Authority
Toxic Reduction and Control Department
100 First Avenue
Charlestown, MA 02129
617-242-6000

The American Dental Association recommends that

“ . . . dentists eliminate the use of bulk elemental mercury and bulk amalgam alloy and that they use only precapsulated amalgam alloy in their practices.”

- ▶ Phase out bulk mercury and use precapsulated amalgam capsules
- ▶ Send bulk mercury to a recycler
- ▶ If the use of bulk mercury cannot be eliminated, it should be used in a work area with secondary containment to prevent accidental spills from entering the sewer.

**BROKEN OR UNUSABLE AMALGAM CAPSULES
SHOULD BE STORED WITH SCRAP AMALGAM
AND RECYCLED**

Amalgam Handling and Disposal: What you can do:

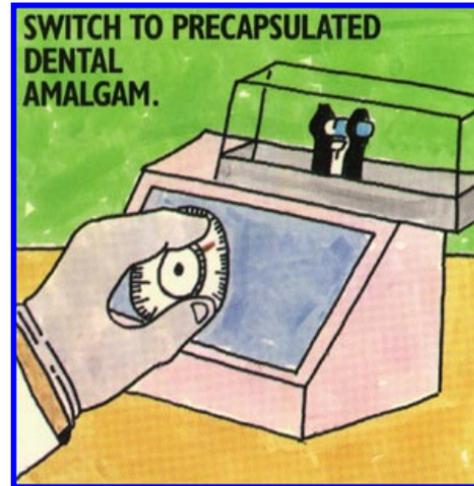
- ▶ Mercury and amalgam particles should be kept out of the drain and trash. They should be collected and stored in airtight containers, and recycled to the maximum extent possible.
- ▶ Use gauze to retrieve excess amalgam during placement. Larger particles should be recycled.

How does Dental Amalgam Affect the Environment? Mercury used in dental amalgam may be released to the environment when it is:

- ▶ discharged to a sewer system
- ▶ disposed of in the trash (which may be incinerated or landfilled)

Scrap amalgam created when new fillings are placed, and amalgam particles created when old fillings are removed, are potential sources of mercury releases. Amalgam particles can be captured in traps and screens before discharge to the sewer, and should be kept out of the sewer by proper maintenance of these devices. Mercury is a highly toxic metal which can build-up in fish and humans. Massachusetts, like many U.S. States, have advisories to limit consumption of fish due to mercury contamination, and dentists are a key contributing source of Mercury.

How can you help keep Mercury out of the Environment?



Use disposable traps that are recommended by the manufacturer of the dental unit and vacuum systems. Follow these steps for managing disposable amalgam traps:



- ▶ When your recyclable amalgam container is full, contact your amalgam or mercury recycler for collection. Be sure you understand your recycler's requirements for packaging and acceptability.
- ▶ Change amalgam traps at least once a week, or as recommended by the manufacturer of the equipment. Turn off high volume evacuation system before changing the amalgam trap from the chair side dental unit.

How do I Recycle Scrap Amalgam?

Amalgam scrap should be collected and stored for recycling in a designated, airtight container. Check with your recycler for any additional requirements.

- ▶ Some recyclers may request that scrap amalgam be kept separate from amalgam from traps and screens
- ▶ If amalgam has been stored with a liquid surface layer, do not decant the liquid into the drain. If the liquid must be decanted before sending the amalgam to a recycler, arrange for other disposal

Be Prepared for Spills: Whether precapsulated amalgam alloy or bulk mercury/alloy is used, we recommend that the office have a written spill clean-up procedure and a mercury spill clean-up kit.

**NEVER RINSE AMALGAM TRAPS OVER
DRAINS OR DISCARD IN THE TRASH**

Amalgam traps and filters in the office vacuum system

Proper use of amalgam traps and filters will significantly decrease the amount of amalgam particles going down the drain. Amalgam particles in the traps and filters used in the office vacuum system should be controlled and kept from going down the drain as much as possible, and properly disposed of, preferably by recycling. The following practices are recommended:

Use a gloved hand to remove amalgam trap and place directly into amalgam trap recycling container. Some recyclers may allow the following:

- ▶ Place the used amalgam trap on the palm of a gloved hand;
- ▶ Pull the cuff of the glove over the amalgam trap and off the fingers, inverting the glove and catching the amalgam trap inside. Place in recycling container.

Reusable Amalgam Traps

Facilities that use reusable traps should avoid the discharge of visible scrap amalgam down the drain as much as possible, by removing it away from the drain, using appropriate protective equipment. Facilities should store the scrap in an airtight container, and as required by the recycler or waste hauler. Never rinse amalgam traps over the drain or discard in the trash.

Vacuum Pump Filters

Secondary vacuum pump filters should be changed periodically in accordance with the manufacturer's recommendations (in general, once a month). The used filters may contain amalgam. If they contain amalgam, you may be able to include used filters in the same container with your recyclable amalgam. Contact your manufacturer or your recycler.

Amalgam Separators

Dental facilities might use amalgam separator technologies to remove more amalgam from their wastewater. Systems vary widely in sophistication, cost, and manual operating requirements. Tests performed elsewhere in the United States and Europe have claimed amalgam removal rates of over 90%. (MDS, DEP and MWRA have not verified such claims). MWRA and MDS will be testing these units locally in 1998, and will have more information later in the year.

X-RAY FIXER IS CONSIDERED HAZARDOUS BECAUSE OF ITS HIGH SILVER CONTENT

Other Wastes

Dental facilities can also be sources of other wastes and toxic pollutants, including wastes from X-ray processing and equipment cleaning, and medical wastes. (Medical and infectious wastes are beyond the scope of this brochure.) The MDS has endorsed a vendor to help with chemical processing and infectious waste disposal. For further information on medical and infectious wastes, contact MDS.

X-ray cleaner

Many cleaners for X-ray systems contain chromium. Dentists should avoid discharging products containing chromium, and seek other means of disposal.

Lead foil and shields

Lead foil and shields are easily recyclable. Recycling options include mail-in services.

Cements containing Zinc Phosphate

Some cements used in dental procedures are derived from zinc phosphate. Zinc is a toxic water pollutant regulated by MWRA. Dentists should consider substituting other products for zinc-based cements, and taking steps to keep zinc solids out of the drains, for example by wiping cement off spatulas or cleaning them over the trash rather than over a sink.

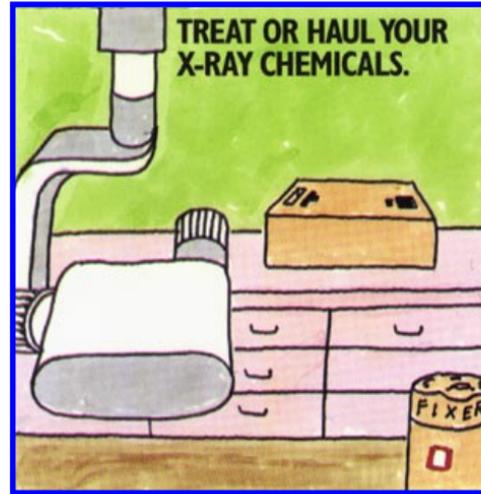
Acids and Caustics

Products with a low or high pH should not be discharged directly to the sewer. MWRA's pH limits prohibit discharges with pH below 5.5 or higher than 10.5.

Flourescent and Mercury Vapor Light Bulbs

These bulbs contain mercury which is released when the lamps are broken, disposed of in a landfill, or combusted. They should be stored carefully in a labelled box and turned over to a recycler or licensed disposal facility. When possible, replace with low-mercury lamps.

Silver-bearing wastes, including X-ray fixer, should not be discharged to the sewer unless they are first treated in a properly sized, designed, installed, operated, maintained, and serviced standard silver recovery system. Otherwise, fixer should be taken off-site for treatment and disposal.



X-ray wastes: Fixer and Developer

Developer solutions should not be mixed with fixer solutions, and may only be discharged to the sewer if they have not been mixed with fixer.

Dentists who are not connected to a sewer system should have their developer hauled by a hazardous waste hauler. DEP regulations do not allow disposal of developer into septic systems.

MWRA would like to thank the San Francisco Water Pollution Prevention Program
for the use of the graphics in this brochure.



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