

ADA Guidelines for Clinical Handling of Dental Amalgam

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Clinical context

Dental amalgam is a direct restorative material prepared by mixing mercury with dental amalgam alloy, the latter consisting of a mixture of predominantly silver, tin and copper. The clinical use of dental amalgam is declining for a range of reasons, including aesthetics, its lack of adhesion and thus the need to remove additional tooth structure to achieve retention of the restoration, and concerns regarding the contamination of the environment by mercury.

Contents

Dental mercury.....	1
Safe clinical use of amalgam	1
Management of amalgam waste.....	2
A practical guide for dental clinics.....	3

Dental mercury

The Minamata Convention on Mercury is an international treaty developed by the United Nations Environment Program and is aimed at reducing the amount of anthropometric mercury in the environment by restricting its use in products and processes. Australia ratified the Convention in December 2021, with an effective date of March 2022, from when it became legally binding. Its provisions were supported by the Australian Dental Association.

For most mercury containing products and processes, the Convention required a 'phase-out' by 2020, however dental amalgam was given a specific table in the Convention (Annex A, Part II), which specified a 'phase-down' instead of a phase-out. Although the amount of mercury entering the environment from dental sources is extremely small, practitioners have an ethical and professional responsibility to eliminate such mercury. Parties to the Convention were required to undertake two of a list of nine actions in the table, and in May 2022 additional text was added. The effect of part of this additional text is that, by 1 January 2024, amalgam can only be used in pre-dosed encapsulated form and the use of mercury in bulk form is prohibited.

It is therefore strongly recommended that, as soon as practical and in any case by 1 January 2024, practitioners:

- discontinue the use of free mercury
- arrange for stocks of free mercury to be returned to an authorised recycler in an unbreakable, tightly sealed container
- use only pre-dosed precapsulated amalgam complying with international standard *ISO 20749:2017 Dentistry - Precapsulated dental amalgam*, published by the International Organization for Standardization

Safe clinical use of amalgam

It is essential to eliminate the possibility of exposure of dental personnel to mercury. To this end, practitioners are recommended to:

- stock a variety of capsule sizes, complying with ISO 20749:2017
- avoid direct skin contact with mercury or freshly mixed dental amalgam

- avoid exposure to the following potential sources of mercury vapour:
 - malfunctioning mixing machines (use a machine compliant with ISO 7488:2018 - Dentistry - mixing machines for dental amalgam)
 - during placement and condensation of amalgam
 - during polishing or removal of amalgam; use water cooling and high velocity evacuation
 - vapourisation of mercury from contaminated instruments
 - open storage of amalgam scrap or used capsules
- train all personnel involved in the handling of mercury and dental amalgam regarding the potential hazards of mercury vapour and the necessity of observing good mercury hygiene
- install impervious, easy to clean surfaces including continuous seamless-sheet flooring extending up the walls
- work in well-ventilated areas, with fresh air exchanges and outside exhaust. if the work areas are airconditioned, replace the air-conditioning filter periodically
- clean amalgam contaminants from instruments before heat sterilization or heat disinfection
- avoid heating mercury or amalgam or any equipment used with amalgam
- follow best management practices for amalgam waste

Management of amalgam waste

Amalgam waste, kept separate from other waste, can be safely recycled and the mercury recovered through a distillation process and reused in new permitted products. Recycling is best practice for amalgam waste management for dental clinics.

Types of amalgam waste

- Non-contact amalgam (scrap) is excess mix leftover at the end of a dental procedure
- 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, scrap left on instruments/ matrix bands and amalgam captured by chairside filters. Amalgam sludge, a mixture of liquid and solid material collected within the amalgam separator or other amalgam capture devices, is biologically contaminated.

A practical guide for dental clinics

NON-CONTACT AMALGAM (SCRAP)

- Store amalgam waste in a wide-mouthed, airtight container labelled 'Amalgam waste for recycling', or equivalent wording
- Amalgam scrap may be mixed with body fluids, such as saliva or other potentially infectious material, so use personal protective equipment such as gloves, masks and protective eyewear
- Make sure the container lid is well sealed
- Discuss with your EPA Licensed Amalgam Waste recycler whether it is necessary to use different containers for contact and non-contact scrap

CONTACT AMALGAM

- Place extracted teeth containing amalgam into a wide-mouthed, airtight container labelled 'Extracted teeth containing amalgam'
- When the container is full, contact your EPA Licensed Amalgam Waste recycler for collection
- Be aware that different jurisdictions may have different requirements regarding disposal of extracted teeth containing amalgam.

USED AMALGAM CAPSULES

- Place empty capsules and capsules that cannot be emptied into a wide-mouthed, airtight container labelled 'Amalgam capsule waste for recycling' or equivalent wording
- Ensure that the container lid is well sealed
- When full, contact your EPA Licensed Amalgam Waste recycler for collection

AMALGAM SEPARATORS

- Install an amalgam separator which complies with *ISO 11 143-2008 Dental equipment – amalgam separators**
- Consult the supplier for specific recommendations consistent with practice conditions, e.g., space, plumbing, access, workload and regulatory requirements
- Check supplier instructions for replacement of the waste container

AMALGAM WASTE CONTAINER

- Check supplier instructions for replacement of the Amalgam Waste Container (varies from volume guideline to time cycle e.g. annual replacement)
- Replace the filled container according to the manufacturer's recommended schedule, or when the indicator light comes on and/or auditable warning sounds
- Follow the manufacturer's instructions for removing the filled container
- Make sure the container lid is well sealed
- Contact your EPA Licensed Amalgam Waste recycler for collection
- Install the replacement container according to manufacturer's instructions.

DISPOSABLE CHAIR SIDE TRAPS

- Open the chairside 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' or equivalent wording
- Make sure the container lid is well sealed
- When the container is full, contact your EPA Licensed Amalgam Waste recycler for collection
- Traps from dental units dedicated strictly to hygiene and non-amalgam related activities may be placed into the contaminated waste.

REUSABLE CHAIR SIDE TRAPS

- Open the chairside 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' or equivalent wording
- Make sure the container lid is well sealed
- When the container is full, contact your EPA Licensed Amalgam Waste recycler for collection
- Replace the trap into the chairside unit. (Do *not* rinse the filter under running water as this could introduce dental amalgam into the waste stream.)

SUCTION MACHINE FILTER

- Change or empty the filter according to the manufacturer's recommended schedule
- Follow the manufacturer's instructions for removing the filter
- Remove the filter while holding the filter over a tray or other container that can catch any drips
- Empty the contents into a wide-mouthed, airtight container that is marked 'Contact Amalgam Waste for Recycling' or equivalent wording
- Make sure the container lid is well sealed
- When the container is full, contact your EPA Licensed Amalgam Waste recycler for collection
- Replace the filter into its housing according to the manufacturer's instructions.

SUCTION SYSTEM DISINFECTANTS

- Use only suction system disinfectants recommended by the suction machine and amalgam separator manufacturer. (The use of other disinfectants, particularly those that contain Chlorine, may damage the equipment resulting in breakdowns or leaks.)

INSTRUMENTS

- Clean scrap amalgam from instruments and matrix bands over a tray to catch scrap amalgam particles
- Place the scrap into the amalgam recycling container (see above)

ULTRASONIC CLEANING SOLUTION

- Dispose of ultrasonic cleaning solution via the suction system and amalgam separator

*ISO STANDARDS

The appropriate standard for amalgam separators is *ISO 11 143 Dental equipment – amalgam separators*, which specifies that compliant separators will remove 95% of amalgam waste prior to discharge into the waste water stream.

Related resources

ADA [Policy Statement 6.18](#) – Safety of dental amalgam

ADA [submission](#) on the National Phase down of Mercury: Ratification of the Minamata Convention

FDI World Dental Federation, Statements on amalgam and mercury, 2021: [Part 1](#), [Part 2](#)

Contribute to the development of ADA guidance to the profession

This Guideline has been developed by ADA expert committees. Feedback from the profession is welcome and may be submitted to contact@ada.org.au for consideration in future guideline development.