

MANAGEMENT AND DISPOSAL OF AMALGAM WASTE IN DENTAL OPERATORY

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ABSTRACT

Unwanted release of mercury from mercury containing amalgam s is a great concern in the Dental operator. Mercury is toxic that accumulates in the body with risk of many health problems . This manuscript discusses the various protocols for disposal of amalgam wastes.

KEY WORDS: Amalgam, Mercury, contamination, protocols , Disposal.

INTRODUCTION

One possible environmental impact from the practice of dentistry is from the unwanted release of elemental mercury and mercury-containing amalgam from dental offices. The dental profession is one of the largest end-users of mercury.¹ In 2004, the global anthropogenic release of mercury into the environment was more than 5000 metric tons, out of which about 50% originated from Asia.²

The routes of mercury pollution from the dental office are mainly from:

- Unregulated disposal of amalgam waste in the regular municipal waste or the domestic sewerage wastewater because of high-risk methods of amalgam manipulation³
- Disposal of extracted teeth in hospital waste, that is often incinerated and
- Autoclaving/ heat sterilizing of amalgam-filling dental instruments¹.

Why is Mercury a Concern?

Mercury is a persistent, toxic contaminant and it bio-accumulates in the tissue of living organism⁴. High concentrations of mercury, mainly in fish poses serious health risks to people who consume them⁵. Populations that are particularly sensitive to the health risk of consuming contaminated fish include: pregnant women, women of childbearing age, children, and people dependent upon fish for their daily diet⁵. Mercury and the use of amalgam is

in controversy since last 30 years almost. Scandinavian countries have begun to phase out the use of amalgams completely⁶⁻⁹, whereas organizations such as the American Dental Association, Center for Disease Control and Prevention, the US Public Health Service and the World Health Organization support the use of dental amalgam to fill cavities but with strict observance of amalgam waste protocols³. Looking into the kind of practice and its popularity among dentist and the patients in India, even we have to comply with the use of amalgam by implementing the best possible ways to minimize the extent of damage to nature.

Reducing Mercury Contamination

Dentists have many options available to them to reduce the amount of amalgam inadvertently leaving their operatory. Mainly they fall into two categories of waste management strategies⁴:

- Pollution prevention actions and
- Control actions—also called “best management practices.”

Pollution prevention

The goal of pollution prevention is to reduce or eliminate the use of toxic or polluting substances at the source. Pollution prevention activities and recycling in dental operatory are essential in order to minimize releases of polluting substances into the sewer system, medical waste, or ordinary trash.

Best Management Practices

Best management practices¹⁰ are economically achievable as always feasible in practical measures or actions that can be used to control or reduce the entry of pollutants (mercury, amalgam) into the environment.

Sources of Scrap Dental Amalgam from Operations.

There are three sources of scrap amalgam in dental operations¹¹:

- Excess amalgam which is mixed, but not used or spilled amalgam/mercury.
- Amalgam from operatory drain, which is trapped, can be handled as scrap amalgam as long as the traps contain little or no tissue.
- Amalgam contained in extracted teeth.

Additional Sources of Mercury in Dental operatory

Any electrical equipment with switches or temperature controls (thermostats) may contain mercury. Mercury is an essential ingredient for most energy efficient lighting products, including CFLs.¹² Other Mercury containing equipment's like thermometers and blood pressure units also contain elemental mercury.

So, precaution must be taken by operator and other non-technical staffs to dispose these equipment's, as they poses serious health hazards by disposing elemental mercury present in then down the drain, in the sharps container, biohazard bag, or trash. Rather they should be disposed as the regular mercury waste, has been discussed further.

Guidelines for handling Amalgam/mercury waste in Dental Operatory^{4,10,13,14}.

1. Marked Container: The scrap amalgam container should be of a different color (silver). Place scrap amalgam from all sources into that container (as defined by OSHA) that is initially marked "Biohazards". To differentiate from biomedical waste which is placed in a red bag or container,
2. Decontaminate: Scrap amalgam should be decontaminated and stored as per OSHA guideline, by keeping it dip in Radiographic

Fixer Solution¹⁵ and should not be stored in water alone and at the time of transportation the container must be filled with 1:10 (Bleach to Water) solution, in closed lid container only.

3. Do not use any method that utilizes heat for decontamination. The heat will cause the mercury to volatilize and be released to the environment.
4. Label: label "Biohazards" marking on the container with a label stating "Scrap amalgam recycle from (month/day/ year)."
5. Never place extracted teeth with amalgam restorations in the red biohazard bag. They should be placed in the SCRAP AMALGAM container. Use universal precautions when handling extracted teeth (glasses, gloves and mask).
6. In case of mercury spillage latex gloves must be avoided and nitrile glove is preferred as mercury can penetrate latex.
7. Iron wool can be used to collect spilled mercury.
8. Operatory must be well ventilated with installation of exhaust system.
9. Whenever indicated, the old amalgam restoration must be taken out as a "chunk" with minimal grinding instead of complete grinding with rotary headpiece.
10. Drainage from patient spittoon must be collected in over flow waste trap, to collect the settled restorative waste.
11. Collected waste in closed container can later be handed over to the authority / organisation such as metal recyclers, pollution control board, and municipal office.
12. Amalgam waste should not be ever incinerated or dump in ground.

CONCLUSION

Looking into the destruction that mercury and its alloy can cause to nature and to our country, it becomes our ethical responsibility to practice amalgam / mercury waste management in more efficient fashion as compared to present day practice. Although by any means it is impossible to revert the distruction already caused but, above mentioned guidelines are the best and more over practicable ways to reduce the extent of further damage.

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