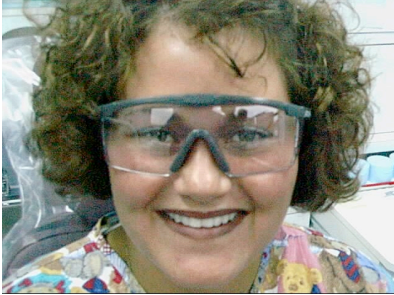


# Physical Barriers to Reduce Mercury Exposure During Amalgam Removal

Received.....9/15/99 Scientific Review.....9/30/99 IAOMT Board Review.....10/8/99 Reevaluation.....9/01/00, 12.28.05	<h2 style="margin: 0;">Biological Support</h2>	<b>Approval.....10/8/99</b> Provisional Approval No Opinion No Approval
<b>Explanation of IAOMT position:</b> This is an update and addition to: Patient Protection During Mercury Amalgam Removal		

<b>Name of Scientific Review:</b> Physical Barriers To Reduce Mercury Exposure During Amalgam Removal.
<b>Alternative name(s) of Scientific Review:</b> Reducing Patient Hg exposure.
<b>This Scientific Review related to both Medicine and Dentistry.</b>
<b>This Scientific Review is a procedure.</b>
<b>Purpose of the Scientific Review:</b> Since many individuals seeking amalgam replacement are medically compromised, the following procedures are essential to protect the patient against inadvertent mercury exposure. For such individuals, <u>all</u> the described procedures are deemed necessary. For medically less compromised subjects, fewer protective procedures may be employed, at the discretion of the attending dentist. However, it is recommended that all procedures be used wherever possible.
<b>Scientific Review History:</b> Many patients report adverse reactions following amalgam removal. In the medically compromised individual or the metal sensitive individual, even small amounts of amalgam exposure can cause adverse reactions.
<b>Briefly describe the Scientific Review:</b> This Scientific Review covers the essential protective procedures that could be employed in the healthy and medically compromised patient. The medically compromised patient presents a significant therapeutic challenge. For example, medical histories of allergies or Multiple Sclerosis (or other autoimmune diseases), neurological diseases, kidney diseases, cardiovascular diseases, respiratory diseases, and Psychiatric disorders may be more vulnerable to the toxic effects of even low doses of mercury. Special attention must be employed to minimize mercury exposure in these medically people compromised.
<b>Specifically, describe the Scientific Review:</b> <ol style="list-style-type: none"> <li style="margin-bottom: 10px;"> <b>1. Activated charcoal</b>            Approximately 15-30 minutes before amalgam removal, the patient should take a charcoal caplet. This supplement will bind some of the minute amalgam particles that may be inadvertently swallowed during the drilling procedure. A second caplet should be taken at the end of the appointment. Thereafter, activated charcoal should be avoided because it can also absorb certain good nutrients and medications. Activated charcoal has been used as a medical aid for stomach upset and food poisoning. It is also used in some hospitals for serious poisoning cases. Since the material is an over-the-counter medication, with low incidence of side effects, its usage does not appear to present a problem. Also see Scientific Review on Pre-amalgam Removal-Activated Charcoal Slurry rinse and Swallow.         </li> <li style="margin-bottom: 10px;"> <b>2. Room fans for ventilation</b>            An excellent method to protect the patient is to have a small fan placed on the left, behind the patient (if the dentist is left-handed place it on the right) that will blow a stream of air across the patient towards their feet. Any vapors or particulate material are kept out of the breathing zone. This is standard procedure in Occupational Health and Safety.         </li> <li> <b>3. Eye protection</b>            The eye is very sensitive and delicate and should be protected from exposure to mercury particles. Dental tooth surgery always produces an aerosol of vapor, fluid droplets and tooth and/or filling particles. It is just good         </li> </ol>

practice to protect the patient's eyes with goggles when undertaking any tooth drilling, because mercury vapor is very lipid soluble and can readily cross skin and membranes. This protection will also eliminate the possibility of physical damage to the eye that could result from trauma of filling material falling in the eye, and protect the sensitive eye from allergic or local toxic reactions.



#### 4. Protective coverings

The use of a large plastic drape over the patient is also recommended. This protects the patient from immediate exposure to filling particles on the skin and minimizes the absorption of mercury through the skin since mercury vapor is can readily pass across tissues. It also ensures that the clothes do not collect mercury-filling dust, which would be transported to the home and act as an **exposure to infants**, if picked up by the patient.

Cloth drapes must be placed over the face, to protect against absorption through the facial skin. It also minimizes the collection of particles in the hair of the scalp or face.



#### 5. Rubber dam

Rubber dam is a thin sheet of rubber that is placed in the mouth over the teeth with only the tops of the teeth protruding through.

##### Advantages

- A. A dry working field is maintained for the dentist because the rubber holds back the saliva.
- B. The rubber dam protects the patient from possible inadvertent injury from the high-speed drill and ensures that foreign objects are not swallowed.
- C. The dentist is also protected, since saliva and body fluids are held back, reducing the potential for infection.
- D. The rubber dam does not allow the drilled particles of the removed mercury filling to be swallowed, nor does mercury vapor diffuse across the oral tissues into the bloodstream.

##### Disadvantages

- A. Those few individuals who may be allergic to the latex or corn starch in or on the dam material. Here non-latex dams should be employed.
- B. Some circumstances are difficult, if not impossible, for rubber dam use, due to tooth location or size for the clamp.
- C. Mercury vapor passes through latex instantly so a working saliva ejector is necessary to remove the vapor (be certain the patient doesn't stop it with their tongue)
- D. Rubber dam takes extra time to place, but it is the safest way to do dental treatment.
- E. Some find the rubber dam uncomfortable or claustrophobic. These personal difficulties should be discussed thoroughly with the patient.
- F. Possible fracture of tooth and damage to hard and soft tissues during clamp placement and removal

Mercury vapor passes through the rubber dam. This can be minimized by applying a sulfur mixture to the underside of the dam.<sup>1</sup>

**A specific description of this Scientific Review: Mercury Vapor Exposure - Under Latex Gloves**

- Mix flour of sulfur (1 tsp.) into about 8 oz. of hand lotion
- Apply the paste to the surface of the outside surface of the rubber dam
- Immediately after amalgam removal is complete, dispose of the dam and replace with a new un-coated dam for restorative procedures.



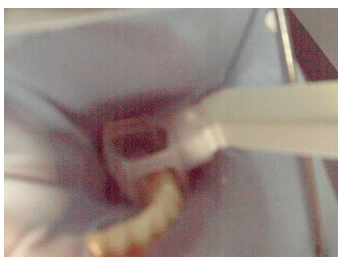
**6. Alternate source of breathing air**

Since during removal of the filling some mercury vaporizes, an alternate source of breathing air is essential for the medically compromised or suspected mercury sensitive patient. Compressed medical air delivered to the patient through either a nosepiece or nasal canula is the best method. This ensures that the risk to breathing the mercury vapor and dust is reduced. This protocol will significantly reduce the incidence of unwanted side affects.<sup>2</sup> If compressed medical air is not available; the move the end of the mask hose away from the patient. The hose placement should not be on the floor.



**7. A suction device CLEAN-UP™**

This device, designed in Sweden and available through the IAOMT, slips over the tooth to be treated and will suction away considerably more mercury vapor and particles than the usual dental suction devices. Highly recommended. See Scientific Review Oral Evacuator Isolate Attachment.



**8. High pressure drills**

Using the 90-psi drill, the dentist should section the mercury fillings. By sectioning the mercury filling, less drilling

time is necessary and therefore less mercury vapor is produced.

**9. High volume suction**

Most dental offices are equipped with high volume intra-oral suction. Sometimes, due to the large amount of water recommended, one vacuum tip is not sufficient. Some dentists will employ two such vacuums. The vacuum removes the water and particles, but also helps to reduce the mercury vapor and particle exposure.<sup>2</sup>

Extra oral vacuums are also recommended. A chair side air cleaner that captures odors and vapors in the dental operatory that escapes from the patient's oral cavity notably during the mercury removal process in order to protect the patient and staff. This vapor is odorless and invisible and therefore very insidious. Devices sold with air abrasion technology have proven useful during amalgam removal procedures. See Scientific Reviews on IQ Air and DentAir Vac.

The final patient protection looks like the following picture.



**New Additions to this document.**

1. Room fans
2. Patient body drapes
3. Patient face protection
4. Eye protection
5. Extra high speed hand pieces
6. Extra-oral vacuums

**Manufacturer(s):**

- |                                     |                           |
|-------------------------------------|---------------------------|
| 1. Practicon Inc.                   | Protective face coverings |
| 2. IAOMT                            | Clean-up                  |
| 3. Dentairvac or SmartAir Solutions | Extra-oral suction        |
| 4. Any Health Food Store            | Activated charcoal        |
| 5. Any Safety Supply Co.            | Protective glasses        |

**Scientific Literature:**

1. Adams, J. (1998): IAOMT Scientific Review, Mercury vapor Protection- Under latex Gloves.
2. Ziff, M. (1996): IAOMT Scientific Review, Reducing Mercury Vapor Exposure for the Patient during Amalgam removal.
3. Ziff, M. (1993): IAOMT Scientific Review, Clean-Up

**Legal Aspects of this Scientific Review:**

No legal precedents at this time. However, in the future it may be considered malpractice not to take such precautions, especially with the medically compromised patient.

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The IAOMT and Mankind Thanks You!