

## 2003 ADA Mercury Hygiene Recommendations (1/04)

2003 ADA Council on Scientific Affairs Mercury Hygiene Recommendations. J Am Dent Assoc 2003;134:1498-1499.

The ADA Council on Scientific Affairs has recently updated its 1999 mercury hygiene recommendations.<sup>1</sup> The overall goal is to ensure the safety of all dental personnel and minimize the release of mercury into the environment. However, the Council on Scientific Affairs maintain that this update is not intended to establish a standard of care or to set requirements that must be followed in all cases.

Dental personnel can be exposed to mercury through direct skin contact with mercury or freshly mixed dental amalgam or through exposure to the following sources of mercury vapors: accidental mercury spills; malfunctioning amalgamators, leaky amalgam capsules or malfunctioning bulk mercury dispensers (the ADA recommends against the use of bulk elemental mercury); trituration, placement and condensation of amalgam; polishing or removal of amalgam; vaporization of mercury from contaminated instruments; and open storage of amalgam scrap or used capsules. The following are mercury hygiene recommendations designed to reduce potential mercury exposure:

### GENERAL MERCURY HYGIENE RECOMMENDATIONS

- Train all personnel involved in the handling of mercury and dental amalgam regarding the potential hazards of mercury vapor and the necessity of practicing proper mercury hygiene.
- Remove professional clothing before leaving the workplace.

### OFFICE ENGINEERING

- Work in well-ventilated work areas, with fresh air exchanges and outside exhaust. The air-conditioning filters should be replaced periodically.
- Use proper work area design to facilitate spill containment and cleanup. Floor coverings should be nonabsorbent, seamless and easy to clean. The Council does not recommend the use of carpeting in operatories, where an accidental mercury spill might occur. Chemical decontamination of carpeting may not be effective, as mercury droplets can seep through the carpet and remain inaccessible to the decontaminant. Removal of the contaminated carpet may be the only way to ensure decontamination.
- Periodically check the dental operator for mercury vapor. This may be done using dosimeter badges or through the use of mercury vapor analyzers for rapid assessment after any mercury spill or cleanup procedure. The current Occupational Safety and Health Administration (OSHA) standard for mercury is 0.1 milligram per cubic meter of air averaged over an eight-hour work shift.<sup>2</sup> The National Institute for Occupational Safety and Health has recommended the permissible exposure limit to be changed to 0.05 mg/m<sup>2</sup> averaged over an eight-hour work shift over a 40-hour workweek,<sup>3</sup> but OSHA has not yet adopted this recommendation.

### HYGIENE RECOMMENDATIONS DURING PREPARATION AND PLACEMENT OF AMALGAM

- Use only capsulated amalgam alloys. The ADA recommends against the use of bulk alloy and bulk elemental (i.e., raw liquid) mercury in the dental office.
- Use an amalgamator with a completely enclosed arm.
- If possible, recap single-use capsules after use, store them in a closed container and recycle them.
- Use care when handling amalgam. Avoid skin contact with mercury or freshly mixed amalgam.
- Use high-volume evacuation systems (fitted with traps or filters) when finishing or removing amalgam.



### MANAGEMENT OF MERCURY SPILLS

In case of an accidental mercury spill (regardless of size), the Council endorses the following recommendations<sup>4</sup>:

- Never use a vacuum cleaner to clean up the mercury.
- Never use household cleaning products to clean up the spill, particularly those containing ammonia or chlorine.
- Never allow mercury to go down the drain.
- Never use a broom or a paintbrush to clean up the mercury.
- Never allow people whose shoes may be contaminated with mercury to walk around or leave the spill area until the mercury-contaminated items have been removed.



## MANAGEMENT OF SMALL MERCURY SPILLS

A spill is considered small if there are less than 10 grams of mercury present (no larger than a quarter).<sup>5,6</sup> Small spills can be cleaned safely using commercially available mercury cleanup kits and by observing the steps listed in the Michigan Department of Environmental Quality's "Management of Mercury Spills" table.<sup>7</sup>



## MANAGEMENT OF LARGE MERCURY SPILLS

A mercury spill is considered large if there are more than 10 g of mercury present (larger than the size of a quarter).<sup>5,6</sup> Cleanup of large mercury spills requires experienced environmental personnel.

## ADA Council for Scientific Affairs References

1. ADA Council on Scientific Affairs. Dental mercury hygiene recommendations. JADA 1999;130:1125-1126.
2. Occupational Safety and Health Administration. Standard interpretations. (1996) PEL for inorganic mercury is a time weighted average, not a ceiling. Available at: "[www.osha.gov](http://www.osha.gov)". Accessed Jan 2004.
3. National Institute for Occupational Health and Safety. Occupational health guidelines for inorganic mercury. Available at: "[www.cdc.gov](http://www.cdc.gov)". Accessed Jan 2004.
4. U.S. Environmental Protection Agency/Purdue University. Mercury in buildings. Available at: "[pasture.ecn.purdue.edu/~mercury/src/frame.htm](http://pasture.ecn.purdue.edu/~mercury/src/frame.htm)". Accessed Jan 2004.
5. Virginia Commonwealth University, Office of Environmental Health and Safety, Chemical/Biological Safety Section. Mercury spills. Available at: "[www.vcu.edu/oehs/chemical/mercuryspills.html](http://www.vcu.edu/oehs/chemical/mercuryspills.html)". Accessed Jan 2004.
6. Prince Edward Island [Canada] Department of Fisheries, Aquaculture, and Environment. Guidelines for the safe clean-up of household mercury spills. Available at: "[www.gov.pe.ca/photos/original/fae\\_mercury.pdf](http://www.gov.pe.ca/photos/original/fae_mercury.pdf)". Accessed Jan 2004.
7. Michigan Department of Environmental Quality. (2003). Cleaning up small mercury spills. Available at: "[www.michigan.gov](http://www.michigan.gov)". Accessed Jan 2004.

**DIS Comment: The updated ADA Council of Scientific Affairs mercury hygiene guidelines provides mercury hygiene recommendations in a more user-friendly format. It recommends against the use of carpet in dental operatories and gives additional guidance on the management of mercury spills.**

**Mercury hygiene training is available on the DECS Continuing Education Web page. Professional clothing (e.g., clinical attire, smocks) is provided at all USAF dental clinics. Concerning office engineering, the recommendations address three areas: ventilation, floor covering, and mercury vapor monitoring.**

**Military clinic design standards meet ventilation recommendations outlined in the article. It is interesting to note that although the replacement of air conditioning filters may be beneficial for other health reasons, commercial air conditioning filters are designed for the collection of airborne particulate matter and have no effect on mercury vapor. The only filters that have been shown to help reduce mercury vapor levels contain specific chemical absorbents (usually iodized charcoal).<sup>3,5</sup>**

**All USAF facilities designed or remodeled IAW federal guidelines adhere to the updated recommendation of not having carpet in dental operatories. Concerning the monitoring of dental operatories for mercury vapor, the recommendation is vague as to what constitutes periodic monitoring. As per AFI 48-145 surveillance need and frequency of mercury vapor monitoring is determined by Bioenvironmental Engineering (BEE). If elevated mercury vapor levels are suspected, dental commanders should contact BEE IAW AFOSH Standard 48-8. Typically, mercury vapor levels are monitored only after suspected or identified mercury exposure (e.g., after a mercury spill). Consultation with local BEE personnel will determine what schedule (if any) is required by federal or local requirements.**

**The recommendations provide excellent information concerning the management of mercury spills. DIS has published a synopsis of commercially available mercury spill kits. See DIS 60 for further information. In the event of a mercury spill that cannot be managed in the dental clinic, contact local BEE and Civil Engineer personnel for assistance.**

## References

- Military Handbook 1191, 9 July 2002.
- Eames WB, Palmertree CO. Twelve dental mercury devices: an evaluation of methods of monitoring, containment, and removal of mercury. Oper Dent 1980;5:72-81.
- Koski RE, Kantor J, Gough EJ. Controlling mercury vapor within the dental operatory. CDA J 1981;9:33-39.
- Brown D. The decontamination of a mercury-polluted room with iodized-charcoal filter fans. Br Dent J 1984;156:453-454.