

Facts about Dental Mercury Pollution

Dental Mercury Pollution

Quantity of Dental Mercury: According to the WHO report *Future Use of Materials for Dental Restoration*, the amount of dental mercury entering the environment is “significant”: “A significant amount of mercury is estimated to be released to the environment from the use of dental amalgam either as an indirect result of the diversion of traded amalgam for other purposes or as a result of improper waste management practices or through cremation.”¹ Between 313 and 411 tons of dental mercury is consumed annually, making it one of the largest consumer uses of mercury in the world.² The demand for dental mercury is higher than the demand for almost all other mercury products – more than lighting (120-150 tons), measuring devices (300-350 tons), and electrical devices (170-210 tons).³ As other mercury products are being phased out, amalgam is fast becoming the largest source of mercury pollution from products.

Amalgam Pathways into the Environment: Managing amalgam waste with separators and best management practices alone “is not sufficient in itself to address the whole range of mercury releases from the dental amalgam life cycle...”⁴ Dental mercury is still entering the environment via many unsound pathways. For example, dental mercury is polluting: (1) air via cremation, dental clinic emissions, sludge incineration, and respiration; (2) water via dental clinic releases and human waste; and (3) soil via landfills, burials, and fertilizer.⁵

Environmental Health Concerns: The U.S. EPA says, once in the environment, “certain microorganisms can change elemental mercury into methylmercury, a highly toxic form that builds up in fish, shellfish and animals that eat fish. Fish and shellfish are the main sources of methylmercury exposure to humans. Methylmercury can damage children’s developing brains and nervous systems even before they are born.”⁶

Costs of Dental Mercury

External Costs of Amalgam: Once the environment costs are taken into account, amalgam is more expensive than non-mercury alternatives.⁷ Environment and society are adversely impacted over “the whole life cycle of dental amalgam – mercury production, preparation of filling materials, removal of old fillings and placement of new ones, environmental and health impacts from mercury recycling, discharges to wastewater, solid waste disposal, emissions from crematoria and releases from cemeteries.” Counting these environmental costs, amalgam can cost up to \$87 more than a composite filling.⁸

Amalgam Problematic in Developing Countries: In addition to the expenses of addressing dental mercury pollution, amalgam poses accessibility and cost problems for developing nations without widespread electricity. For example, the Pan American Health Organization report *Oral Health of Low Income Children: Procedures for Atraumatic Restorative Treatment (PRAT)* says, “Throughout the LAC Region, the traditional treatment for dental caries disease remains the Amalgam-based approach, which can be costly and is not always widely available, especially for disadvantaged populations.”⁹ Techniques using non-mercury alternatives can be both more accessible and less costly than amalgam in developing nations.¹⁰

Alternatives to Dental Mercury

Quality of Non-Mercury Alternatives: According to the WHO report *Future Use of Materials for Dental Restoration*, “recent data suggest that RBCs [resin-based composites] perform equally well” as amalgam.¹¹ Based on input from European governments, environmentalists, and dentists from all over

the European Union, the BIO Intelligence Service (BIOIS) *Study on the Potential for Reducing Mercury Pollution from Dental Amalgam and Batteries* concludes “Given the results of recent studies comparing the longevity of different materials, in the present study it is considered that the longevity of Hg-free fillings is no longer a factor with significant effect on the overall cost difference between dental amalgam and composite or glass ionomer restorations.”¹² BIOIS also notes that “With regard to young children, longevity of the restoration is not a relevant concern since baby teeth will fall out long before the restoration fails.”¹³

Safety of Non-Mercury Alternatives: The 2012 Health Care Research Collaborative report *Mercury in Dental Amalgam and Resin-Based Alternatives: A Comparative Health Risk Evaluation* explains, “In sum, though data gaps continue to exist for the health effects of the alternatives to mercury amalgam, other than individual allergies to components of one or another composite, there is no current evidence of significant personal or environmental toxicity.”¹⁴

Benefits of Non-Mercury Alternatives: Additionally, the non-mercury alternatives offer benefits that amalgam does not. The WHO report *Future Use of Material for Dental Restoration* states that “Adhesive resin materials [such as composite] allow for less tooth destruction and, as a result, a longer survival of the tooth itself. Funding agencies should take the initiative and encourage the replacement of amalgam as the material of choice for posterior teeth with adhesive systems.”¹⁵ The WHO report adds “It may be more important to examine tooth survival and to preserve tooth structure than filling survival... Preservation of the tooth in a functional state should be taken into consideration rather than retention of the material used for restoration; this is in line with goals for oral health suggested by WHO.”¹⁶

¹ World Health Organization, FUTURE USE OF MATERIALS FOR DENTAL RESTORATION (2011),

http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.13

² http://www.chem.unep.ch/mercury/Atmospheric_Emissions/Technical_background_report.pdf, p.20

³ UNEP, *Mercury-Containing Products Partnership Area Business Plan* (2011),

<http://www.unep.org/hazardoussubstances/Mercury/InterimActivities/Partnerships/Products/tabid/3565/language/en-US/Default.aspx>

⁴ BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/Final_report_11.07.12.pdf, p.108

⁵ Mercury Policy Project, European Environmental Bureau, and Consumers for Dental Choice, *The Real Cost of Dental Mercury* (March 2012), http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=158%3Athe-real-cost-of-dental-mercury&Itemid=70

⁶ EPA (2010),

<http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/a640db2ebad201cd852577ab00634848!OpenDocument>

⁷ Mercury Policy Project, European Environmental Bureau, and Consumers for Dental Choice, *The Real Cost of Dental Mercury* (March 2012), http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=158%3Athe-real-cost-of-dental-mercury&Itemid=70

⁸ Mercury Policy Project, European Environmental Bureau, and Consumers for Dental Choice, *The Real Cost of Dental Mercury* (March 2012), http://www.zeromercury.org/index.php?option=com_phocadownload&view=file&id=158%3Athe-real-cost-of-dental-mercury&Itemid=70, pp.3-4

⁹ Pan American Health Organization, *Oral Health of Low Income Children: Procedures for Atraumatic Restorative Treatment (PRAT)* (2006), http://new.paho.org/hq/dmdocuments/2009/OH_top_PT_low06.pdf, p.xi.

¹⁰ Pan American Health Organization, *Oral Health of Low Income Children: Procedures for Atraumatic Restorative Treatment (PRAT)* (2006), http://new.paho.org/hq/dmdocuments/2009/OH_top_PT_low06.pdf

¹¹ World Health Organization, FUTURE USE OF MATERIALS FOR DENTAL RESTORATION (2011), http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.11

¹² BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/Final_report_11.07.12.pdf, p.69

¹³ BIO Intelligence Service (2012), *Study on the potential for reducing mercury pollution from dental amalgam and batteries*, Final report prepared for the European Commission-DG ENV, http://ec.europa.eu/environment/chemicals/mercury/pdf/Final_report_11.07.12.pdf, p.69

¹⁴ Health Care Research Collaborative of the University of Illinois at Chicago School of Public Health, the Healthier Hospitals Initiative, and Health Care Without Harm, *Mercury in Dental Amalgam and Resin-Based Alternatives: A Comparative Health Risk Evaluation* (June 2012), http://www.noharm.org/lib/downloads/other/Mercury_in_Dental_Amalgam.pdf, p.6

¹⁵ World Health Organization, FUTURE USE OF MATERIALS FOR DENTAL RESTORATION (2011), http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.16

¹⁶ World Health Organization, FUTURE USE OF MATERIALS FOR DENTAL RESTORATION (2011), http://www.who.int/oral_health/publications/dental_material_2011.pdf, p.27, 29