

## About dental fillings and Alzheimer's disease

*This fact sheet is prepared by the Alzheimer's Association for your information only and does not represent an endorsement of dental amalgam.*

### **Do silver dental fillings increase risk for Alzheimer's disease?**

According to the best available scientific evidence, there is no relationship between silver dental fillings and Alzheimer's. The concern that there could be a link arose because “silver” fillings are actually made of an amalgam (mixture) that typically contains about 50 percent mercury, 35 percent silver and 15 percent tin. Mercury is a heavy metal that, in certain forms, is known to be toxic to the brain and other organs.

In one of the most notorious demonstrations of mercury's potentially toxic effects, thousands of people, cats and birds living near Japan's Minamata Bay developed severe neurological symptoms in the 1950s and 1960s. Scientists eventually traced the cause of the devastating disorder, which came to be known as Minamata disease, to mercury contamination released into the bay by a nearby chemical plant. In another example, the notion of “mad as a hatter,” immortalized by Lewis Carroll in *Alice in Wonderland*, probably arose because hat makers experienced the neurotoxic effects of vapors from a mercury-based chemical used to process wool felt.

Studies have confirmed that amalgam fillings emit small amounts of mercury vapor during installation or removal and as they wear in the mouth. In theory, these vapors could be absorbed and travel to the brain, where they might damage nerve cells. In laboratory cultures of nerve cells, mercury appears to affect some of the biochemical processes implicated in Alzheimer's disease.

In March 1991, the Dental Devices Panel of the U.S. Food and Drug Administration (FDA), which regulates amalgam, met to discuss possible hazards of the material. After reviewing scientific literature, animal studies and patient

case reports, the panel concluded that there was no current evidence that amalgam poses any danger. However, the panel also recommended more research to clarify any potential risks.

Also in 1991, the U.S. National Institutes of Health (NIH) funded a study at the University of Kentucky to investigate the relationship between amalgam fillings and Alzheimer's disease. The study, a collaboration involving the university's Sanders-Brown Center on Aging and the College of Dentistry, enrolled hundreds of participants from central Kentucky as well as some from Wisconsin. Kentucky enrollees came from research programs at the university's Alzheimer's Disease Center. Wisconsin enrollees were participants in the Nun Study, a long-term project investigating the relationship between a variety of environmental and genetic factors and Alzheimer's disease in 678 School Sisters of Notre Dame.

The amalgam study research team obtained an extremely detailed dental history documenting how many fillings each participant had, where in the mouth the fillings were located, how long the fillings had been present, and how much surface area they covered. Participants also agreed to have their brains autopsied to confirm their Alzheimer diagnosis or lack of brain pathology and to measure levels of mercury in their brain tissue. Over the length of the study, the researchers collected data from 68 individuals with Alzheimer's and 33 without the disease who met all study criteria.

Data analysis by University of Kentucky statisticians revealed no significant association between Alzheimer's disease and any aspect of silver fillings—their number, location, duration or surface area. Brain tissue samples revealed no correlation between Alzheimer's disease and levels of mercury. The researchers analyzed the tissue samples with a highly sensitive technique capable of detecting extremely low levels of mercury.

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In 2003, environmental health experts published a comprehensive review of the health effects of mercury in the October 30 *New England Journal of Medicine*. The authors concluded that current evidence shows no connection between mercury-containing dental fillings and Alzheimer's or other neurological diseases.

Many scientists consider these studies compelling evidence that dental amalgam is not a major risk factor for Alzheimer's disease. Public health agencies, including the FDA, the U.S. Public Health Service and the World Health Organization, endorse the continued use of amalgam as a safe, strong, inexpensive material for dental restorations.

### **Where can I get more information?**

The NIH study evaluating the relationship between dental amalgam and Alzheimer's is: Saxe, Stanley R., et al. "Alzheimer's Disease, Dental Amalgam, and Mercury." *Journal of the American Dental Association* 1999; February; 130 (2): 191 – 199.

The article reviewing the health effects of mercury is: Clarkson, Thomas W. et al. "The Toxicology of Mercury: Current Exposures and Clinical Manifestations." *New England Journal of Medicine*. October 30, 2003: 1791 – 1737.

Our expert consultant for this fact sheet was Stanley R. Saxe, DMD, the primary investigator in the NIH-sponsored study evaluating the relationship between dental amalgam and Alzheimer's disease. At the time of that study, he was professor of periodontics and geriatric dentistry and director of the Geriatric Oral Health Program at the College of Dentistry, University of Kentucky.

The Alzheimer's Association is fighting on your behalf to give everyone a reason to hope. For more information about Alzheimer research, treatment and care, please contact the Alzheimer's Association.

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