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LITTLE EVIDENCE TO LINK MERCURY FILLINGS TO HUMAN HEALTH PROBLEMS

A comprehensive examination of research by a panel of independent experts finds insufficient evidence to draw a link between serious adverse health consequences and commonly used “silver” fillings

(December 9, 2004) Bethesda, MD – For many of us, having a dental cavity filled can be a frightening experience. Others take such dental repair in stride. Regardless of how you approach a trip to the dentist, you can take comfort in a new report, which concludes that the peer-reviewed scientific and medical literature published since 1996 reveals little evidence of a link between dental mercury and health problems, except in rare instances of allergic reactions.

The new report entitled *Review and Analysis of the Literature on the Potential Adverse Health Effects of Dental Amalgam*, is the latest to be published by the Life Sciences Research Office (LSRO), <http://www.lсро.org/>. For nearly half a century, LSRO has been retained to provide independent expert scientific opinions and evaluations for the health, biosciences and food industries, as well as the federal government.

The report was prepared at the request of the federal Trans-agency Working Group on the Health Effects of Dental Amalgam. This *ad hoc* body is composed of representatives from the National Institutes of Dental and Craniofacial Research of the National Institutes of Health, the Center for Devices and Radiological Health of the U.S. Food and Drug Administration, the Centers for Disease Control and Prevention, and the Office of the Chief Dental Officer of the Public Health Service. This project has been funded in whole or in part with federal funds from the National Institute of Dental and Craniofacial Research, National Institutes of Health, under Contract No. NO1-DE-12635.

Background

Dental amalgam is an alloy (mixture) of elemental mercury with other metals, which may include silver, copper, tin, and zinc. It has been used as a restorative material for dental cavities for more than 150 years, and the Academy of General Dentistry estimates that more than one billion amalgam restorations (fillings) are placed each year. Dentists use dental amalgam because the material is durable, easy to work with, and can be placed rapidly into a prepared tooth.

The Controversy

Despite its long history of use, dental amalgam has stirred controversy due to its mercury content. For nearly a century, concerns have been raised about the potential adverse human health effects that may arise from the inhalation and absorption of mercury vapor

from dental amalgam. Opponents claim that mercury release from dental amalgam leads to a variety of health problems after its placement in the mouth.

Numerous government and independent agencies have examined the safety of dental amalgam and have concluded that the scientific evidence consistently demonstrates the human body absorbs mercury vapor released from dental amalgam restorations. Despite this absorption of mercury, scientific panels assembled by the U.S. Public Health Service, the European Commission and the World Health Organization (WHO) have concluded there is no scientifically relevant and definitive evidence to demonstrate a causal link between dental amalgam and adverse health effects, except in rare instances of allergic reactions. At the same time, some governments have recommended against placement of dental amalgam restorations in certain patient populations.

The Study

LSRO was tasked to examine the peer-reviewed, primary scientific and medical literature published between January 1, 1996 and December 31, 2003 relating to dental amalgam and human health. The purpose of this review was to:

- provide information about the absorption and distribution of mercury in the human body,
- evaluate the findings from the recent scientific and medical literature, and
- identify research gaps that when filled may definitively support or refute the hypothesis that dental amalgam causes adverse health effects.

To insure a fresh and unbiased approach, experts were selected from outside the dental research community. LSRO selected a panel of internationally recognized experts in the fields of immunotoxicology, immunology and allergy; neurobehavioral toxicology and neurodevelopment; pediatrics; developmental and reproductive toxicology; toxicokinetics and modeling; epidemiology; pathology; and general toxicology.

Methodology

Some 950 scientific and medical studies were considered. Approximately 300 of the studies met criteria for scientific merit and study design and were used to construct the final report. In addition to the literature gathered by LSRO and the Expert Panel, recommendations submitted by the public in response to a Federal Register Request for Information on Dental Amalgam were considered, as were oral and written public comments submitted by parties interested in the issue.

Studies of mercury vapor or dental amalgam exposure in humans provided the primary basis of the review. Criteria commonly used to assess biologic plausibility were used to guide the experts' discussions of whether the evidence supported a causal relationship between dental amalgam exposure and adverse human health effects. Evidence regarding adverse human outcomes was evaluated from several perspectives, to include: epidemiological studies, secular trend data, animal toxicity studies, dose-response relationships, and the plausibility of biological mechanisms.

Findings

Highlights from LSRO's findings include the following:

- There is insufficient evidence to support a correlation between dental amalgam exposure and kidney or cognitive dysfunction; neurodegenerative disease,

specifically Alzheimer's disease and Parkinson's disease; or autoimmune disease, including multiple sclerosis;

- Various non-specific complaints attributed to dental amalgam have not been shown to be due to increased mercury release and absorption from dental amalgam;
- Mercury exposure from dental amalgam in the general U.S. population is low, but increases with the number of dental amalgam restorations; and
- Long term use of nicotine chewing gum combined with intense chewing habits and greater than 20 dental amalgam surfaces has been shown to have more impact on exposure to mercury vapor than bruxism (teeth clenching or grinding) or dental amalgam placement and removal.

Conclusions

The report concludes that there is little evidence to support a causal relationship between mercury fillings and human health problems. The authors noted, however, that many research gaps existed, which, if addressed, may settle the dental amalgam controversy once and for all.

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For nearly half a century, the Life Sciences Research Office (LSRO) has provided expert objective scientific opinions and evaluations to governmental agencies and leading corporations in the food, health and bioscience sectors. A non-profit organization originally established in 1962 by the Federation of American Societies for Experimental Biology, LSRO provides independent science-based analysis and advice.

Editor's Note: A copy of the report is available to the press. To receive a copy and schedule an interview with an LSRO staff member, please contact Donna Krupa at 703.527.7357 (office), 703.967.2751 (cell) or djkrupa1@aol.com.