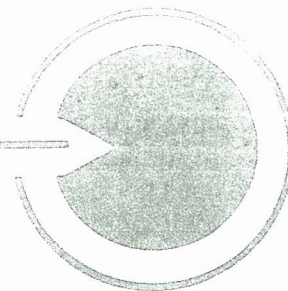


# BIO-PROBE

# NEWSLETTER



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## MERCURY FROM AMALGAM FILLINGS TRACED TO ORGANS AND TISSUES!

Hahn, Leszek J.; Kloiber, Reinhard; Vimy, Murray J.; Takahashi, Yoshimi; and Lorscheider, Fritz L.

Dental "silver" tooth fillings: a source of mercury exposure revealed by whole-body image scan and tissue analysis.

The FASEB Journal. Vol. 3:2641-2646. Dec. 1989.

**ABSTRACT:** "Mercury (Hg) vapor is released from dental "silver" tooth fillings into human mouth air after chewing, but its possible uptake routes and distribution among body tissues are unknown. This investigation demonstrates that when radioactive  $^{203}\text{Hg}$  is mixed with dental Hg/silver fillings (amalgam) and placed in teeth of adult sheep, the isotope will appear in various organs and tissues within 29 days. Evidence of Hg uptake, as determined by whole-body scanning and measurement of isotope in specific tissues, revealed three uptake sites: lung, gastrointestinal, and jaw tissue absorption. Once absorbed, high concentrations of dental amalgam Hg rapidly localize in kidneys and liver. Results are discussed in view of potential health consequences from long-term exposure to Hg from this dental material."

**AUTHORS' CONCLUSION:** "Our laboratory findings in this investigation are at variance with the anecdotal opinion of the dental profession, which claims that amalgam tooth fillings are safe."

**THE AUTHORS:** This research study was conducted by the Departments of Radiology, Medicine, and Medical Physiology of the University of Calgary, Faculty of Medicine, Calgary, Alberta, T2N 4N1, Canada. Murray J. Vimy, D.M.D., F.A.G.D., F.I.A.O.M.T. is the dental member of the team. The other investigators are M.D.s or Ph. D.s in medical research. Purely dental researchers know dentistry, but are not expert on medical or physiological considerations. This research team and the research facility are highly qualified to investigate and evaluate the dental, medical, and physiological aspects of the use of dental mercury amalgam fillings. The safety of dental mercury amalgam fillings should, and will, be determined by the cooperative efforts of experts in the various human health disciplines and not by dentists alone.

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Canada. Murray J. Vimy, D.M.D., F.A.G.D., F.I.A.O.M.T. is the dental member of the team. The other investigators are M.D.s or Ph. D.s in medical research. Purely dental researchers know dentistry, but are not expert on medical or physiological considerations. This research team and the research facility are highly qualified to investigate and evaluate the dental, medical, and physiological aspects of the use of dental mercury amalgam fillings. The safety of dental mercury amalgam fillings should, and will, be determined by the cooperative efforts of experts in the various human health disciplines and not by dentists alone.

**THE JOURNAL:** The FASEB Journal is the Official Publication of the Federation of American Societies for Experimental Biology--The American Physiological Society - American Society For Biochemistry and Molecular Biology - American Society for Pharmacology and Experimental Therapeutics - American Association of Pathologists - American Institute of Nutrition - The American

Association of Immunologists - The Society for Cell Biology. It consists of over 30,000 scientists in these human health investigative disciplines. It is a highly respected and esteemed organization that presents no bias on the issue of the safety of dental mercury amalgam fillings.

**THE EXPERIMENTAL PROTOCOL:** The sheep was selected as the experimental model for this study because it is an animal that closely approximates the human in its physiological function and response. In studies of the hard tissue of the teeth, such as the incorporation of fluoride into tooth enamel, sheep are not a good model because of differences in the mineral structure of the teeth themselves. But this was not a study of tooth enamel; it is a study of the fate and physiological effect of a dental filling material. For this purpose, sheep are a far better model than are hamsters, rats, mice, guinea pigs, or other commonly used animals.

The use of radioactively labelled mercury in the experimental fillings guarantees specificity and eliminates the need for control animals. Other possible sources of mercury such as food, air and water will not contain mercury that is radioactively labelled. Extreme measures were taken by the researchers to guarantee experimental accuracy.

Amalgam fillings were placed into 12 molar teeth of the experimental animal. The fillings were deliberately over-carved to a concave form to ensure that they would not wear excessively. Each filling contained approximately 425 milligrams of mercury which, according to literature reports cited by the authors, is about 50% of the mercury in an average molar amalgam filling in humans. The animal was then provided free access to water and fed fresh hay twice daily for 29 days, after which it was sacrificed and evaluated. During the 29 days post-chewing intra-oral mercury vapor measurements were periodically taken. These measurements closely approximated like measurements derived from human subjects in previously published studies. The fate of the dental amalgam mercury was determined by whole-body scanning and measurement of radioactive isotope in specific tissues.

The results of this study clearly demonstrate that "substantial quantities of Hg from amalgam will appear in various body tissues as early as 29 days after placement of amalgam fillings in teeth". The highest levels of mercury were found in kidney, feces, stomach, and liver. Substantial amounts were also found in the gum tissue, the alveolar bone surrounding the teeth, and the lining of the trachea. Even during this relatively short time Hg accumulation was also found in the heart tissue, the brain and several endocrine glands (pituitary, thyroid, adrenal, pancreas, and ovary). The levels of mercury found in the blood and urine were a great deal lower than levels found in most tissues.

In other studies on sheep performed by this research team run as long as 140 days, it was found that Hg from dental amalgam fillings will progressively accumulate in tissues and remain elevated with time. In humans, each dental amalgam filling remains in the tooth an average of 7-9 years and often much longer.

The authors pointed out that it has been scientifically established that mercury can cause autoimmune disorders and that this study established that dental amalgam fillings can be a major source of chronic exposure to mercury.

#### **EDITORIAL**

Previously published research has conclusively demonstrated that mercury is released from dental amalgam fillings and that the amount of mercury released is greatly increased by stressing the fillings with chewing or brushing. Several published human autopsy studies have found a direct correlation between the number of amalgam fillings present and the amount of mercury found in brain and kidney tissues.

This latest study clearly demonstrates that mercury from dental amalgam fillings transfers to numerous body tissues in a very short period of time. There can be no argument over the source of the mercury. It also establishes the entry routes into the body of the dental amalgam mercury. Besides the previously theorized lung inhalation and gastrointestinal absorption routes, this study also clearly identifies the tissues of the oral cavity as an entry route. Considering previously published research on the pathological effects of mercury on oral tissues, this finding adds significance to the consideration of mercury from dental amalgams as an additional factor in periodontal disease. Finally, this study further confirms the fact that measurements of mercury levels in blood and/or urine are not reflective of body burdens of mercury, particularly after exposure primarily to mercury vapor. This is significant and vital research, indeed.

As the authors of this study pointed out "Mercury (Hg) has been the major component of tooth filling