HEALTH CANADA
DENTAL AMALGAM RISK ASSESSMENT

The long awaited Health Canada report entitled "Assessment of Mercury Exposure and Risks from Dental Amalgam" was made public on 27 November 1995 in conjunction with the first "Amalgam Stakeholder Meeting" in Toronto. Although the report does not represent official policy of the Canadian Government, it has been suggested that an official position will be taken after the second Stakeholder Meeting, which will be held in February of 1996.

The Risk Assessment report recommends the establishment of a "Tolerable Daily Intake (TDI)" for mercury vapor and suggests the number of dental amalgam fillings for various age groups that will not compromise the TDI. The synopsis of the report follows:

EXECUTIVE SUMMARY

"For Canadians with amalgam-filled teeth, it was estimated that total mercury (Hg) exposure averages: 3.3 Hg mcg/day in toddlers (aged 3 to 4 years); 5.6 mcg Hg/day in children (aged 5 to 11 years); 6.7 mcg Hg/day in teens (aged 12 to 19 years); 9.4 mcg Hg/day in adults (aged 20 to 59 years); and 6.8 mcg Hg/day in seniors (aged 60+ years). Of this exposure, amalgam was estimated to contribute 50% to total Hg exposure in adults, and 32 to 42% for other age groups. Estimates, based on two independent models, of exposure from amalgam alone were: 0.8-1.4 mcg Hg/day in toddlers; 1.1-1.7 mcg Hg/day in children; 1.9-2.5 mcg Hg/day in teens; 3.4-3.7 mcg Hg/day in adults; and 2.1-2.8 mcg Hg/day in seniors.

There are insufficient published data on the potential health effects of dental amalgam specifically to support or refute the diverse variety of health effects attributed to it. Numerous studies constantly report effects on the central nervous system (CNS) in persons occupationally exposed to Hg. Virtually all studies failed to detect a threshold for the effects CNS measured. A tolerable daily intake (TDI) of 0.014 mcg Hg/kg body weight/day was proposed for mercury vapour, the principal form of mercury to which bearers of amalgam fillings are exposed. This TDI was based on a published account of sub-clinical (i.e. not resulting in overt symptoms or medical care) CNS effects in occupationally exposed men, expressed as slight tremor of the forearm. An uncertainty factor of 100 was applied to these data, to derive a reference dose (TDI) which should, in all probability, prevent the occurrence of CNS effects in non-occupationally-exposed individuals bearing amalgam fillings.

The number of amalgam-filled teeth, for each age group, estimated to cause exposure equivalent to the TDI were: 1 filling in toddlers; 1 filling in children; 3 fillings in teens; and 4 fillings in adults and seniors. It was recognized that filling size and location (occlusal versus lingual or buccal) may also contribute to exposure.
However, data suggest that no improvement in prediction of exposure is offered by any particular measure of amalgam load. Therefore, the estimates of exposure derived from the number of filled teeth were considered as reliable as those that might be based on size and position of amalgam fillings, were such data available for the Canadian population.

Effects caused by allergic hypersensitivity to amalgam or mercury, including possible auto-immune reactions, can not be adequately addressed by any proposed tolerable daily intake. Individuals suspecting possible allergic or auto-immune reactions should avoid the use of amalgam by selecting suitable alternate materials in consultation with dental care (and possibly health care) professionals."

**BIO-PROBE COMMENT:** There are several dramatic features of this report. First and foremost, Dr. Richardson concludes that the daily exposure to mercury from amalgam fillings is not without possible health risk to patients. This is the same conclusion that was presented by the United States Public Health Service in 1994, which stated: "Thus, both MRLs are below estimated exposure levels from dental amalgam [USPHS. ATSDR. Toxicological Profile for Mercury (Update), TP-93/10, page 125]." The USPHS statement referred to its Minimal Risk Level (MRL) Standards for chronic and acute exposure to mercury vapor for the general population.

Dr. Richardson recommends a Tolerable Daily Intake (TDI) of 0.014 mcg Hg/kg body weight/day. This would translate to a daily intake of 0.98 micrograms of mercury/day for the average 70 kilogram (154 pound) adult. The USPHS established mercury vapor exposure MRLs and computed them to intake levels of 0.28 and 0.4 micrograms of mercury/day for chronic and acute exposure to mercury vapor. Most importantly, the USPHS MRLs are already a formal Standard of the United States Government, and therefore not subject to interpretation or dismissal.

The agreement between the USPHS and the Health Canada report is significant and dramatic; both determinations are well below the estimations of daily intake of mercury vapor from dental amalgam derived by both spokespersons of the dental profession (1.2-3.0 micrograms Hg/day) and medical scientific experts (mean of 10 micrograms Hg/day). Further, it should be pointed out the unknown levels of mucosal absorption of amalgam mercury are not considered in these conclusions. Of primary importance is the fact that these standards of the governments of the United States and Canada are for the general population, not for just otherwise healthy adult workers limited to a maximum of forty hours per week of mercury vapor exposure. The dental profession continues to compare the continuous daily amalgam mercury exposure to "occupational" workplace standards (where, by the way, the mercury source is not implanted directly into the body), such as that of the United States OSHA (50 mcg Hg/m³ of air). This position of the dental profession is inexcusable!

The second dramatic feature of the Health Canada report is the calculation of mercury vapor intake related to age (i.e. average body weight) and the conversion of this to the maximum number of amalgam dental fillings in each age group that will not compromise the TDI. This factor has already received widespread attention in the Canadian media and has even been reported in the United States. Few reasonably prudent parents will believe that one mercury filling is totally harmless for their child, while two mercury fillings presents a possible health risk.

Another important feature of the Health Canada report is that it was peer-reviewed by a large international panel of experts before submission. Naturally, defenders of dental amalgam are attempting to undermine the report by claiming that it was not subject to peer-review; a spin that is patently false. Further, any person that reads the report in its entirety must be impressed by the monumental effort and documentation supporting Dr. Richardson's conclusions.

Finally, the Health Canada report concisely summarizes the weak foundation for the safety of dental amalgam. In the Introduction, the report states: "There is considerable debate and controversy as to the validity of reports of illness associated with dental amalgam (Weiner et al. 1990; Molin 1992; Eley and Cox 1993; Berry et al. 1994; and others). Their onset has been attributed to psychosomatic factors (Swedish National Board of Health, 1994), and the remission or elimination of effects following amalgam removal has been attributed to placebo effect (Englund et al. 1994). However, there have been no properly controlled and conducted clinical investigations that provide unequivocal data to support or refute health hazards attributed to this dental material. Despite the recognition of the lack of adequate clinical studies as early as 1931 (Souder and Sweeney 1931), again in 1987 (Enwonwu 1987), and in 1990 (Weiner et al. 1990), appropriate studies have not been initiated by
dental practitioners, amalgam manufacturers/distributors or regulatory agencies in Canada or elsewhere.

With regard to the epidemiological literature, there have been no adequately conducted epidemiological studies of amalgam bearers, with proper controls and objectively measured signs and symptoms. The studies which have been reported (Ahlquist et al. 1988, 1993; Lavstvedt and Sundberg, 1989) fail to provide unequivocal evidence of absence of effects due largely to methodological weaknesses. Lack of adequate control groups, potential bias in subjectively reported symptoms, and failure to focus on disease states most likely to arise from amalgam or Hg exposure limit their value in the current assessment. [ED. NOTE: These are the two "studies" frequently cited to defend the safety of dental amalgam.] The number of animal studies which have employed amalgam specifically, rather than Hg, methyl mercury, mercuric chloride, or some other form, is also limited."

Organized dentistry is already attempting to discredit the Health Canada report. A media advisory from Dr. John Zapp, Executive Director of the American Dental Association has been reported on Internet. It stated: "A Canadian researcher has released a review of literature on the contribution mercury from dental amalgam makes to overall body intake. The research was commissioned by Health Canada, the Canadian government agency responsible for judging safety and efficacy of therapeutic materials and agents. The report is not a policy document of the Canadian government and has not been subjected to the peer review process that it would encounter if it were to be published in a reputable scientific journal." Dr. Zapp would be well advised to be more careful in determining the validity of his statements. His charge that the report was not peer reviewed is false.

A letter dated 4 December 1995, sent by Canadian Dental Association President Dr. James R. Brookfield to its membership attempted to discredit the Health Canada report with five points: 1. The report is by a single commissioned researcher; 2. The identity of the reviewers was not revealed; 3. The report is "yet another review and analysis" and does not constitute new research; 4. The conclusions on average exposure to mercury from dental amalgam is in agreement with other studies, but the other studies did not estimate daily intake; and 5. An uncertainty factor of 100 has been employed in the study. The letter also stated: "The CDA is exploring the potential for an international panel to carry out an independent review to this end", referring to its belief that the data utilized in the report should be reinterpreted.

The CDA letter included an addendum page with seven "Dental Amalgam Reviews", six of which were published in the Journals of the American Dental Association, the Canadian Dental Association or the British Dental Association; the seventh was that of a "Consensus Committee" report. Presumably, this is what the CDA considers "independent review." Indeed, one must wonder if the stated intention of the CDA to establish an international panel to review the Health Canada report will have its "independence" guaranteed by specific selection of reviewers by CDA. A truly independent review panel would consist of experts on mercury toxicology, without a vested interest in dental amalgam and preferably having published research on the pathophysiology of dental amalgam mercury - as was apparently established by Dr. Richardson.

The objection of the CDA to a safety factor of 100 is baffling, indeed! This factor is not only acceptable, it is actually a standard policy in risk assessment. A safety factor of 10 is applied to incorporate high risk subgroups (i.e. children, and the elderly); the other safety factor of 10 is applied when the risk assessment is based on data which does not establish a NOAEL (No Observed Adverse Effect Level). Data based on a LOAEL (Lowest Observed Adverse Effect Level) does not establish the minimal exposure level that will not cause adverse effects. The CDA should know this; if not, Dr. Richardson explains it in the report! [ED. NOTE: Does this mean that the CDA objections where formulated without benefit of reading the Health Canada report?]

The eventual position of the Canadian Government should be most interesting. Obviously, defenders of dental amalgam are making every effort to block or alter the report by Dr. Richardson. On the other hand, the extensive media coverage following release of the report insures widespread awareness of the conclusions and recommendations. Judging from the response from organized dentistry, it appears to be in conflict with the interests of the public health as determined by the Health Canada report. Bio-Probe is confident that the officials of the Canadian Government will act in the best interest of the citizens of Canada, rather than bowing to the demands of organized dentistry.

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WHO/FDI CONSENSUS STATEMENT ON DENTAL AMALGAM

Bio-Probe has previously reported on the recent joint
World Health Organization (WHO)/Federation Dentaire Internationale (FDI) "Consensus Statement on Dental Amalgam" [BPNL, 11(6):5, Nov 1995]. Note was made of the difficulty in determining the individuals responsible for the report and the documentation supporting the consensus statement. Further information has now been obtained, although the individuals responsible still remains a mystery.

In its promotional material, the Federation Dentaire Internationale describes itself as "the world-wide, professional, independent organization of Dentistry", claiming more than one hundred National and International Dental Associations as members. The FDI also boasts of "a formal partnership and close collaboration with WHO" and, most interestingly, with other dental trade organizations including the "International Dental Manufacturers (IDM)." The promotional flyer also declares: "To co-ordinate the world’s expertise to produce and disseminate policies and 'state-of-the-art' consensus reports are increasingly important tasks for the FDI" and "Obviously, the industry and the FDI have many of these interests, concerns and goals in common."

Amazingly then, the FDI publicly proclaims alliance with dental manufacturers and WHO in the production and dissemination of consensus reports! This information explains the recent WHO/FDI "Consensus Statement on Dental Amalgam", along with its similarity in wording and context to the other dental amalgam consensus statements that have been promulgated. In its own words, FDI has admitted representing the interests of the dental manufacturers and influencing WHO in that direction.

Bio-Probe has obtained a copy of a letter sent under the aegis of the Director-General of WHO noting transmission of the WHO/FDI Consensus Statement on Dental Amalgam to the "Governments of Member States." The letter is dated 25 October 1995, but is unsigned. The accompanying consensus statement also contains the following caveat: "This document is not issued to the general public, and all rights are reserved by the World Health Organization (WHO). The document may not be reviewed, abstracted, quoted, reproduced or translated, in part or in whole, without the prior written permission of WHO. No part of this document may be stored in a retrieval system or transmitted in any form or by any means - electronic, mechanical or other - without the prior written permission of WHO." For this reason, Bio-Probe will not report on the contents of the WHO/FDI "Consensus Statement on Dental Amalgam [WHO/NCD/ORH/AMAL/95.4]", other than to report that the document is totally devoid of scientific references and/or authorship.

Government sources note that it is very rare that such "secret" documents are issued by WHO and that unsigned documents are also very rare. All of this leads to the inescapable conclusion that something is amiss. If this disgraceful event were ever to be investigated, it may prove to be very embarrassing, if not devastating, to the reputation of the World Health Organization.

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NATIONAL WILDLIFE FEDERATION/USEPA PARTNERSHIP!

On 15 November 1995, the National Wildlife Federation announced the formation of a working partnership with the United States Environmental Protection Agency (USEPA) and Great Lakes region hospitals, doctors and municipal governments to reduce and eventually eliminate the use of mercury in health care establishments.

The National Wildlife Federation, which is the nation's largest membership-supported conservation organization, has received a $41,350 USEPA grant to fund the project and stated: "Mercury contamination continues to be a serious pollution problem for Great Lakes communities." The program will be directed by a Steering Committee composed of doctors, nurses, hospital administrators, pollution prevention experts from state, local, and federal governments, and representatives of citizen groups.

[National Wildlife Federation, 506 E. Liberty, 2nd Floor, Ann Arbor, MI 48104-2210. T: (313) 769-3351]

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SCIENCE

Lorscheider, FL; Viny, MJ; Pendergrass, JC; Haley, BE.

Mercy Vapor Inhalation Inhibits Binding of GTP to Tubulin in Rat Brain: A Molecular Lesion Present in Alzheimer Brain.


ABSTRACT: Hg\(^{2+}\) interacts with tubulin and disassembles microtubules that maintain neurite structure. Hg vapor (Hg\(^{0}\)) is continuously released from "silver" amalgam tooth fillings and is absorbed into brain (FASEB J. 9:504-508, 1995). In the present study rats were exposed to Hg\(^{0}\) 4 h/day for 0, 2, 7, 14 and 28 d at 250 mcg Hg/m\(^3\) air, a concentration present in mouth air of some humans with many amalgam fillings.

Average rat brain Hg concentrations increased significantly (11-47 fold) with duration of Hg\(^{0}\) exposure. By
14 d Hg\(^0\) exposure, photoaffinity labelling of the beta-subunit of the tubulin dimer with [alpha32P]8N3GTP in brain homogenates was decreased 75\%, upon analysis of SDS-PAGE autoradiograms. The identical neurochemical lesion of similar magnitude is evident in most Alzheimer brain homogenates when compared to human age-matched controls.

Since the rate of tubulin polymerization is dependent upon binding of GTP to tubulin dimers, we conclude that chronic inhalation of low-level Hg\(^0\) can inhibit polymerization of tubulin essential for formation of microtubules.

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Abdulla, EM; Calaminici, M; Campbell, IC.
Comparison of Neurite Outgrowth with Neurofilament Protein Subunit Levels in Neuroblastoma Cells Following Mercurochloride Exposure.

ABSTRACT: 1. The objectives of the study were to establish that inhibition of neuronal differentiation in culture (assessed by neurite outgrowth) can be used as a broad spectrum in vitro measure of neurotoxicity. 2. To establish whether a rapid measure of neurite outgrowth could be used. Thus the study examined the relationship between the degree of neurite outgrowth assessed directly by image analysis and neurofilament protein subunit levels measured by ELISA. 3. SKNSH neuroblastoma cells, exposed for up to 6 days to mercuric chloride during initiation and continuation of differentiation, had lower levels of neurofilament proteins than unexposed cells. 4. Preliminary data from parallel examinations of neurite outgrowth assessed by image analysis and neurofilament protein subunit levels assessed by ELISA support a correlation when neurofilament protein levels are decreased by sub-cytotoxic doses of mercuric chloride in SKNSH cells.

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O’Carroll, RE; Masterton, G; Dougall, N; Ehmeier, KP; Goodwin, GM.
The Neuropsychiatric Sequelae of Mercury Poisoning. The Mad Hatter’s Disease Revisited.

ABSTRACT: BACKGROUND: The detailed effects of mercury poisoning on cognitive function, brain anatomy and regional brain function are largely unknown. We report the case of a 38-year-old man who was exposed to toxic levels of inorganic mercury. METHOD: Four years after exposure, the patient was assessed using magnetic resonance imaging (MRI), single-photon emission computerized tomography (SPECT) and detailed neuropsychological evaluation.

RESULTS: The patient developed a myriad of physical and psychiatric complaints, including stomatitis, muscle spasm, tremor, skin rash and the psychiatric syndrome known as ‘erethism’ (Mad Hatter’s Disease). Neuropsychological evaluation revealed marked and significant deficits of attention concentration, particularly when under time pressure. The MRI scan was unremarkable; however, SPECT revealed hypermetabolism of the posterior cingulate. CONCLUSIONS: Mercury poisoning appeared to result in a dysregulation of posterior cingulate cortex, which was associated with attention/concentration deficits and marked anxiety/agitation.

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Fourtes, LJ; Weismann, DN; Graeff, ML; Bale, JF, Jr; Tannous, R; Peters, C.
Immune Thrombocytopenia and Elemental Mercury Poisoning.

ABSTRACT: Three cases of severe mercury toxicity occurring within a family are reported. Two cases of thrombocytopenia occurred in this family and represent the second such report in the literature of an association between elemental mercury toxicity and thrombocytopenia. Three of the children presented with a combination of dermatologic and neurologic manifestations reminiscent of acrodermatitis or pink disease. Each of the four children in this family were treated with dimercaptol succinic acid. The hazard of vacuuming spilled mercury and appropriate clean-up procedures are described.

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Zalups, RK; Knutson, KL; Schnellman, RG.
In Vitro Analysis of the Accumulation and Toxicity of Inorganic Mercury in Segments of the Proximal Tubule Isolated from the Rabbit Kidney.

ABSTRACT: Cellular accumulation and toxicity of inorganic mercury were studied in suspensions (1 mg protein/ml buffer) of proximal tubular segments isolated from the kidneys of rabbits. Mercuric chloride containing trace amounts of radiolabeled inorganic mercury \( {^{203}\text{Hg}}^{2+} \) was added to the buffer to produce a concentration of inorganic mercury ranging from 0.1 to 10 microM.

Significant release of lactate dehydrogenase (LDH) and significant decreases in oxygen consumption (QO2), which were used as indices of cellular injury, were detected only when the tubules were in the presence of 10 microM inorganic mercury. At this concentration of inorganic mercury, cellular release of LDH increased and QO2 decreased significantly between the 1st and 4th
hr of exposure, by which time most of the proximal tubular cells were necrotic.

Maximal cellular content of inorganic mercury was attained within the first 5 min of exposure, during which time nearly 70% of the inorganic mercury in the bath was removed. Accumulation of mercury was more gradual when the tubules were exposed to 0.1 microM inorganic mercury. Addition of 40 microM glutathione, cysteine, or bovine serum albumin to the bath provided the segments of the proximal tubule with complete protection from the toxic effects of 10 microM inorganic mercury. The rate of uptake of inorganic mercury was also significantly decreased. By the end of 4 hr of exposure only about 30% of the content of mercury in the bath was abstracted.

These findings indicate that isolated segments of proximal tubules take up inorganic mercury very rapidly and subsequently become intoxicated. They also show that when compounds containing free sulfhydryl groups are in the presence of inorganic mercury in the bath, the rate of uptake of inorganic mercury is significantly decreased and the tubules are provided protection from the toxic effects of the inorganic mercury.

Kim, P; Choi, BH.
Selective Inhibition of Glutamate Uptake by Mercury in Cultured Mouse Astrocytes.

ABSTRACT: We studied the effects of organic and inorganic mercury (Hg) on the uptake of L-[3H] glutamate (L-GLU) in cultured mouse astrocytes. Following exposure to mercuric chloride (MC) [0.2 to approximately 5.0 microM], selective and dose-dependent inhibition of L-GLU uptake to 50% of control levels was observed, whereas 2-deoxyglucose (2-DG) uptake was not significantly affected. Methylmercuric chloride (MMC) also inhibited L-GLU uptake, but 50% reduction was reached only at a concentration of 10 microM. Inhibition of L-GLU uptake by MMC appears to be closely linked to voltage-sensitive calcium channels as evidenced by the lack of L-GLU uptake inhibition by MMC in calcium-free medium or in the presence of the channel blocker verapamil.

Exposure to a variety of divalent metallic ions, including CuCl₂, FeCl₂ and ZnCl₂, did not affect L-GLU uptake in astrocytes in vitro. Exposure to PbCl₂, however, resulted in a decline in L-GLU uptake, though to a much smaller degree than that observed with Hg compounds. Selective impairment of astroglial L-GLU transport may represent a critical early pathogenetic feature of Hg-induced neurotoxicity.

BIO-PROBE COMMENT: This study provides further evidence that mercury is far more neurotoxic than is lead, and that inorganic mercury is at least as neurotoxic as is methylmercury.

Kasarskis, EJ.
Metallothionein in ALS Motor Neurons.
FEDRIP Database, National Technical Information Service (NTIS).

ABSTRACT: Amyotrophic Lateral Sclerosis (ALS) is a chronic neurodegenerative disease, recognized clinically by its relentless progression of muscle atrophy, weakness, and eventual fatal outcome due to respiratory insufficiency. The illness has no effective treatment. The pathological hallmark of ALS is a selective death of motor neurons in the spinal cord and motor cortex. These features of ALS, however, fail to provide insight into its etiology with the result that several theories of etiopathogenesis have been advanced.

Our research focus is upon the potential involvement of toxic trace metals in causing the death of motor neurons. Heretofore, studies of toxic metals have only considered the possibility of excessive accumulation of a metal in the brain and spinal cord. Our work advanced the notion that mercury is present to excess in ALS patients when compared to age-matched controls based on a multi-element analytical study using neutron activation analysis of several types of tissue. Further studies have suggested that mercury may be localized within spinal motor neurons using photoemulsion histochemistry. Thus it appears that mercury accumulates within the very cells which degenerate in ALS, suggesting that mercury may be a necessary precondition for ALS-type degeneration to occur.

OBJECTIVE: To investigate one aspect of mercury detoxification in ALS. As a prelude, we have ascertained the distribution of metallothionein (MT) in spinal cord by immunocytochemical methods using a polyclonal antibody to a defined epitope present in all forms of human MT. The MTs are a family of structurally-similar, soluble, cysteine-rich, 6-7 kD proteins which detoxify heavy metals by sequestration and also regulate copper and zinc homeostasis.

In control subjects, we found MT immunoreactivity localized to the nucleus, cytoplasm, and axonal extensions of spinal motor neurons. In ALS spinal motor neurons, MT immunoreactivity was absent (or greatly
level of total urinary mercury. It suggested that the filtration through glomerulus was also an important source of urinary mercury, thus offering a new and completely different mercury excretion mechanism of kidney from classical conception.

The results showed as well that the constitution of urinary protein in mercury workers might be of great variety, but the typical figure was the low molecular pattern. Because the changes in constitution of urinary protein were earlier than the changes in quantity, it was considered that the component analysis of urinary protein would be a more significant subclinical index.

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Kostial, K; Blanu'sa, M; Piasek, M; Prester, L; Jones, MM.
Monoisoamyl and Mono-n-hexyl Meso-2,3-Dimercaptosuccinate in Mobilizing 203Hg Retention in Relation to Age of Rats and Route of Administration.

ABSTRACT: Monoisoamyl (Mi-ADMS) and mono-n-hexyl (Mn-HDMS) monoesters of meso-2,3-dimercaptosuccinic acid (DMSA) were given orally or parenterally for the mobilization of inorganic mercury in suckling and older rats. Chelators were administered at a dose of 2 × 0.5 mmol kg⁻¹ on two consecutive days 2 weeks after a single ²⁰³Hg injection. Six days later, whole-body, kidney, liver and brain radioactivities were determined in gamma scintillation counters.

Both Mi-ADMS and Mn-HDMS were found to be superior to DMSA in mobilizing mercury from body and organs. The results were similar after oral or parenteral treatment. The efficiency of both monoesters was even higher in younger than in older rats. This is the first report on the mobilization of mercury from the body of sucklings under conditions of late oral treatment.

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Sallsten, G; Thoren, J; Barregard, L; Schutz, A; Skarping, G.
Long Term Use of Nicotine Chewing Gum and Mercury Exposure from Dental Amalgam Fillings.

ABSTRACT: In experimental studies, chewing gum has been shown to increase the release rate of mercury vapor from dental amalgam fillings. The aim of this study was to investigate the influence of long term frequent chewing on mercury levels in plasma and urine. Mercury levels in plasma (P-Hg) and urine (U-Hg), and urinary cotinine were examined in 18 subjects, who regularly used nicotine chewing gum, and in 19 non-chewing referents. Age and number of amalgam surfaces were similar in the two groups. Total mercury concentrations...
similar in the two groups. Total mercury concentrations were determined using cold vapor atomic absorption spectrometry. The chewing had been using 10 (median) pieces of gum per day for the past 27 (median) months.

P-Hg and U-Hg levels were significantly higher in the chewers (27 nmol/l and 6.5 nmol/nmol creatinine) than in the referents (4.9 nmol/l and 1.2 nmol/nmol creatinine). In both groups, significant correlations were found between P-Hg or U-Hg on the one hand and the number of amalgam surfaces as the other. In the chewers, no correlations were found between P-Hg or U-hg and chewing time per day or cotinine in urine. The impact of chewing was considerable. Although the Hg levels found in the chewers were lower than those where adverse effects are known to appear, the safety margin is small.

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FORUM

IAOMT - 1996 SPRING SESSION


SITE: Reno, Nevada.

HOTEL: Reno Hilton, 2500 East 2nd Street, Reno, NV 89595. Room rate = $89.00/night + tax, double occupancy. IAOMT Code=ORALT. (800) 648-5080.

HOST: Duane E. Christian, DMD. 810 N. Nevada St., Carson City, NV 89701. (702) 882-4122.

PROGRAM:
• Murray J. Vimy, DMD: Scientific Update on Dental Amalgam.
• H. Vasken Aposhian, Ph.D.: Results of the DMPS Challenge for IAOMT Members.
• Diana Echeverria, Ph.D.: Behavioral Effects of Low Level Exposure to Mercury in Dentists.
• Daniel F. Royal, DO: Clinical Evaluation and Treatment of Mercury Toxic Patients.
• John R. Lee, MD: Fluoridation Update.

Plus Workshops:
• W. Jess Clifford, MS: Materials Reactivity Testing.
• David C. Kennedy, DDS: Indirect Composite Restoration.
• Scott J. Loman, DDS: The Use of Bioclear in Endodontic Therapy.
• David W. Regiani, DDS: Low Level Laser Therapy.

If you are a mercury-free dentist or are contemplating going mercury-free, you need to join the IAOMT. The IAOMT has helped fund or has been the catalyst for much of the current scientific research demonstrating that dental amalgam is not the benign dental material that 150 years of use and the ADA would like you to believe. Furthermore, the IAOMT is doing something about Standards of Care and Protocols that protect you, your staff and the patient.

For membership information contact Dr. Ronald M. Dressler, D.D.S. IAOMT, 3071 Campbellton Rd. SW, Atlanta, GA 30311. (404) 349-2088 or FAX (404) 349-2090.

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IAOMT 1996 ANNUAL MEETING

DATE: Friday-Sunday, 27-29 September 1996.

SITE: Houston, Texas.

HOTEL: The Woodlands Executive Conference Center and Resort, 2301 North Mil bend Drive, The Woodlands, TX 77380. Contact: Dana Green, (713) 367-1100. Room rate: $119 single, $134 double (Saturday lunch included). A beautiful facility, with golf course, close to big malls, 20 minutes from airport.

HOST: Dr. William P. Glaros, 17222 Red Oak Dr., #101, Houston, TX 77090. T: (713) 440-1190.

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AUSTRALASIAN SOCIETY OF ORAL MEDICINE AND TOXICOLOGY

Melbourne, Australia. 2-3 March 1996.

Main speaker Murray J. Vimy, DMD, FAGD, FIAOMT. Special conference registration fee for IAOMT members. Details from Dr. Roman Lohn, 8th Floor, 175 Kurrajong House, Melbourne 3000, Australia. Tel: (61)(3) 9650-1660. Fax: (61)(3) 9650-8161. Email: lohn@melbpc.org.au

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AMERICAN ACADEMY OF HEAD, NECK AND FACIAL PAIN

FOURTH ANNUAL MID-WINTER SYMPOSIUM

Date: Friday-Saturday, 19-20 January 1996.

Site: The Radisson Resort, Scottsdale/Phoenix, AZ.

Program: Lectures, discussions and hands-on workshops addressing the diagnosis and treatment of patients presenting orofacial pain complaints; for practitioners and assistants.

Registration: AAHNFP. Cordelia Mason, Executive Director, 520 West Pipeline Road, Hurst, TX 76053-4924. T: (800) 322-8651 or (817) 282-1501.