Mercury/Silver Amalgam Fillings
&
Neurotoxicity

David Kennedy, DDS
Past President
International Academy of Oral Medicine and Toxicology

ACAM
November 2-4 2006

Necessary Elements for Harm

1. **Exposure**
2. **Intake**
3. **Body Burden**

Necessary Elements for Harm

1. Exposure >100 papers

a) **The Dangerousness of Mercury Vapor**
Alfred Stock, Zeitschrift fuer angewandte Chemie, 29. Jahrgang, Vol. 15, No.15, pp 461-466 1926

b) ADA/NIDR National Institute of Dental Research JADA (169-171) Vol.109, 1984

Workshop on the biocompatibility of metals in dentistry

c) Vimy MJ, Lorscheider FL: J Dent Res 64(8):1072-5, 1985.
Serial measurements of intra-oral air mercury; Estimation of daily dose from dental amalgam.

Necessary Elements for Harm

1. Exposure

d) **Masi, J. V.: Status Quo and Perspectives of Amalgam and other Dental Materials International Symposium Proceedings (Friberg, L., Schrauzer, G. N., eds) Thieme-Verlag, Stuttgart ISBN 3-13-102471-2 1994**

Corrosion of amalgams in restorative materials: the problem and the promise.

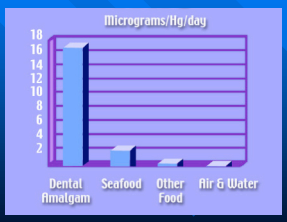
Necessary Elements for Harm

1. Exposure

Liquid droplets of mercury

Necessary Elements for Harm

1. Exposure



Necessary Elements for Harm

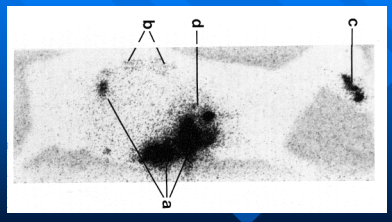
2. Intake

Hahn LJ ; Kloiber R; Vimy MJ; Takahashi Y; Lorscheider F; FASEB J. 3:2641-2646; 1989

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

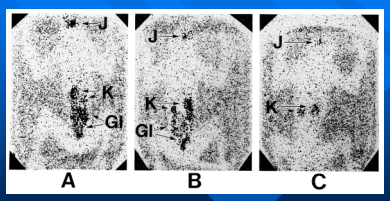
Necessary Elements for Harm

2. Intake



Necessary Elements for Harm

2. Intake



Necessary Elements for Harm

3. Body Brain Burden

Nylander M, Friberg L, Lind B. Swed Dent J 1987; 11; 179-187. **Mercury concentrations in the human brain in relation to exposure from dental amalgam fillings.**

Schiele R. Statements - Discussion. Knolle G (Ed). Koln: Deutsche Arzte-Verlag 1988; pp. 123-131. **Quecksilberabgabe aus Amalgam und Quecksilberablagerung in Organismus und Toxikologische Bewertung. In: Amalgam - Pro und Contra.**

Necessary Elements for Harm

3. Body Brain Burden

Nylander M. Doctoral Thesis, Karolinska Institute 1990.

Accumulation and Biotransformation of Mercury and its Relationship to Selenium after Exposure to Inorganic mercury and Methyl Mercury. A Study on Individuals with Amalgam Fillings, Dental Personnel,* and Monkeys.

Necessary Elements for Harm

3. Body Burden

Nylander M, Friberg L, Eggleston D W, Bjorkman L. Swed Dent J 1989; 13: 235-243.
Mercury accumulation in tissues from dental staff and controls in relation to exposure.

Eggleston D W, Nylander M. J Prosthet Dent 1987; 58: 704-707.
Correlation of dental amalgam with mercury in brain tissue.

Necessary Elements for Harm

3. Body Burden

Eggleston D W, Nylander M. J Prosthet Dent 1987; 58: 704-707.
Correlation of dental amalgam with mercury in brain tissue.

Dental amalgam contains inorganic mercury. In this study, however, total mercury was measured because of the bi-directional conversion between inorganic and organic mercury in humans.

Necessary Elements for Harm

3. Body Burden

Eggleston D W, Nylander M. J Prosthet Dent 1987; 58: 704-707.
Correlation of dental amalgam with mercury in brain tissue.

The overall results from neutron activation analysis averaged more than 3.7 times higher than the overall results from atomic absorption.

Necessary Elements for Harm

3. Body Burden

Eggleston D W, Nylander M. J Prosthet Dent 1987; 58: 704-707.
Correlation of dental amalgam with mercury in brain tissue.

Data from this project demonstrate a positive correlation between the number of occlusal surfaces of dental amalgam and mercury levels in the brain ($p < .0025$ in white matter).

Necessary Elements for Harm

1. Exposure → YES
2. Intake → YES
3. Body Burden → YES

Evidence of Harm

1. Pathophysiology
2. Maternal fetal transfer
3. Vulnerable subsets

Evidence of Harm

1. Pathophysiology

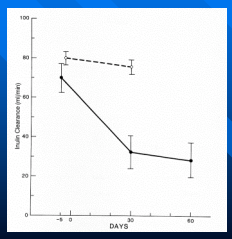
Boyd, N.D.; Benediktsson, H.;Vimy, M.J.; Hooper, D.E.;Lorscheider, F.L.

Mercury from dental silver tooth fillings impairs sheep kidney function

The American Physiological Society 0363-6119 P R1010-R1014 11/1991

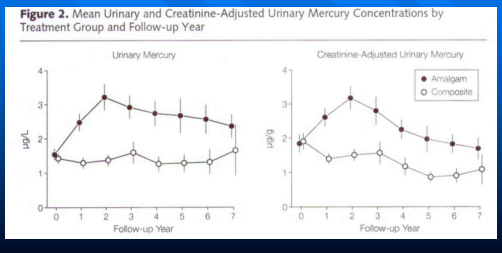
Evidence of Harm

1. Pathophysiology



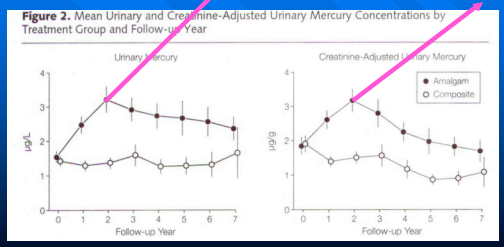
Evidence of Harm

1. Pathophysiology



Evidence of Harm

1. Pathophysiology



Evidence of Harm

1. Pathophysiology

Summers, A.O., Wireman, J., Vimy, M.J., Lorscheider, F.L. Marshall, B., Levy, S.B., Bennett, S., and Billard, L. Antimicrobial Agents and Chemotherapy, Vol. 37 pp. 825-834, 1993

Mercury released from dental "silver" fillings provokes an increase in mercury and antibiotic resistant bacteria in primates oral and intestinal flora.

Evidence of Harm

2. Maternal fetal transfer

a) Takahashi Y, Tsuruta S, Hasegawa J & Kameyama Y. J Dent Res. 71(SI):571 A-445 (1992) **Number of Amalgam Fillings in Pregnant Rats and Mercury Concentration in Their Fetuses.**

b) Drasch G, Schupp I, Reinke R & Roider G. Eur J Pediatr 153:607-610 (1994) **Mercury burden of human fetal and infant tissues.**

Evidence of Harm

2. Maternal fetal transfer

C) Gelbier S, Ingram J. Public Health 103(1):35-40 1/1989

Possible fetotoxic effects of mercury vapor: a case report.

Evidence of Harm

2. Maternal fetal transfer

d) Vimy, M.J.; Takahashi, T.; Lorscheider, F.L. Journal of American Physiological Society, April 1990

Maternal-Fetal Distribution of Mercury (203 Hg) Released from Dental Amalgam Fillings.

Evidence of Harm

2. Maternal fetal transfer

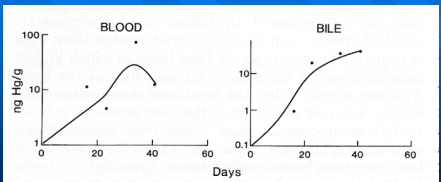


FIG. 11. Concentration of Hg from maternal dental amalgam in blood and bile of 3–5 fetal lambs exposed in utero for various times after amalgam placement.

Evidence of Harm

2. Maternal fetal transfer

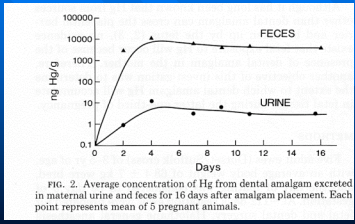


FIG. 2. Average concentration of Hg from dental amalgam excreted in maternal urine and feces for 16 days after amalgam placement. Each point represents mean of 5 pregnant animals.

Evidence of Harm

2. Maternal fetal transfer

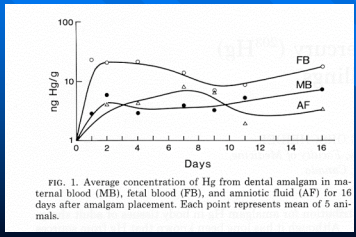


FIG. 1. Average concentration of Hg from dental amalgam in maternal blood (MB), fetal blood (FB), and amniotic fluid (AF) for 16 days after amalgam placement. Each point represents mean of 5 animals.

Evidence of Harm

2. Maternal fetal transfer

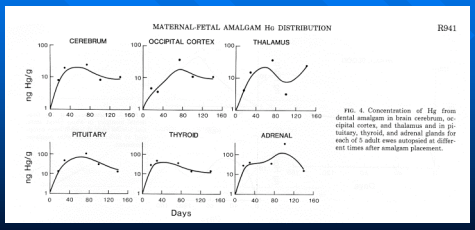


FIG. 4. Concentration of Hg from dental amalgam in brain cerebrum, occipital cortex, and thalamus and in pituitary, thyroid, and adrenal glands for each of 5 adult ewes autopsied at different times after amalgam placement.

Evidence of Harm

2. Maternal fetal transfer

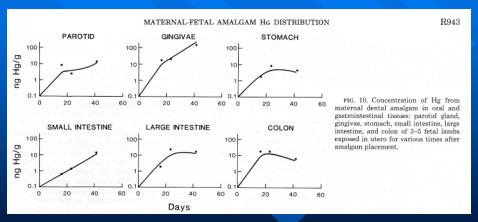


FIG. 10. Concentration of Hg from maternal dental amalgam in oral and gastrointestinal tissues: parotid gland, gingivae, stomach, small intestine, large intestine, and colon of 2–5 fetal lambs exposed in utero for various times after amalgam placement.

Evidence of Harm

2. Maternal fetal transfer

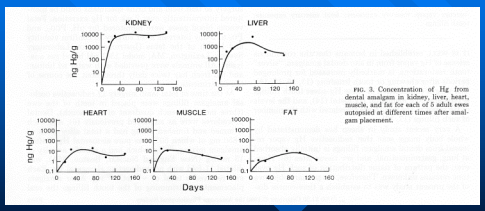


FIG. 3. Concentration of Hg from dental amalgam in kidney, liver, heart, muscle, and fat for each of 5 adult ewes autopsied at different times after amalgam placement.

Evidence of Harm

2. Maternal fetal transfer

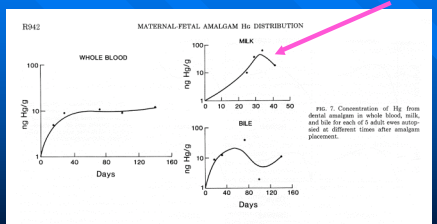


FIG. 7. Concentration of Hg from dental amalgam in whole blood, milk, and bile for each of 5 adult ewes autopsied at different times after amalgam placement.

Evidence of Harm

2. Maternal fetal transfer

f) Vimy MJ, Hooper DE, King WW, Lorscheider FL: Biological Trace Element Research Vol. 56, 1997

Mercury from Maternal "Silver" Tooth Fillings in Sheep and Human Breast Milk

Evidence of Harm

3. Vulnerable subsets

a) Haley, B. Mercury Toxicity: Medical Veratis 2 (2005) 1-8

Genetic Susceptibility and Synergistic Effects.

b) Amy S. Holmes, Mark F. Blaxill, Boyd E. Haley, International Journal of Toxicology 22:277-285, 2003

Reduced Levels of Mercury in First Baby Haircut of Autistic Children

Evidence of Harm

3. Vulnerable subsets

c) Esceverria, D. Woods, JS, et al. Neurotoxicol. Teratol. 2005 Dec 8

The association between a genetic polymorphism of coproporphyrinogen oxidase, dental mercury exposure and neurobehavioral response in humans.

Evidence of Harm

1. Pathophysiology → YES
2. Maternal fetal transfer → YES
3. Vulnerable subsets → YES

No Evidence of Benefit

1. Cost of filling vs. cost of damage
   a) To the tooth
   b) To the health
2. Cost of gum disease
3. Cost of Lichen Planus
4. Cost of Neurological impairment

Cost of Amalgam Use

1. Cost of filling vs. cost of damage
   a) 75% ↓ Decrease in tooth strength
   b) ↑ Fracture$
   c) ↑ Crown$
   d) ↑ Root canal$
   e) ↑ Future co$t of dental care

Cost of Amalgam Use

2. Amalgam linked to gum disease

90% of people have gum disease

66% Cause of tooth loss

3. Amalgam linked to Lichen Planus

A precancerous lesion

60% of lesions spontaneously resolve with amalgam removal

Cost of Harm

4. Cost of Neurological impairment

Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain Vol. 113 #5 May 2005 Environmental Health Perspectives

As an example, about 4 percent of babies, or about 180,000, are born each year in the US with blood mercury levels between 7.13 and 15 micrograms per liter. That level of mercury, the group concluded, causes a loss of 1.6 IQ points.

Cost of Harm

4. Cost of Neurological impairment

Leonardo Trasande, Philip J. Landrigan, and Clyde Schechter Public Health and Economic Consequences of Methyl Mercury Toxicity to the Developing Brain Vol. 113 #5 May 2005 Environmental Health Perspectives

180,000 U.S. babies X $31,800 for lost IQ

=

$5,724,000,000

And total cost may exceed $20 Billion Dollars

FDA Panel Questions

2. Does the draft FDA White Paper objectively and clearly present the current state of knowledge about the exposure and health effects related to dental amalgam?

Score: 13 voted NO to 7 voted YES

FDA Panel Questions

3. Given the amount and quality of the information available for the draft FDA White Paper, are the conclusions reasonable?

Score: 13 voted NO to 7 voted YES

IAOMT Print Submissions

1. An Evaluation of Dental Amalgam Mercury Release and Corresponding Toxicological Concerns Professor Boyd Haley
2. Mercury and Neurotoxicology David Kennedy
3. The Doctrine of Learned Intermediary and Dr. Barnes Robert Reeves Esq. and Jim Love Esq.
4. Suitability of Mercury/Silver Amalgam Filling Implants
5. A Scientific Case Against Amalgam
6. A Scientific Response to the ADA Position on Safety
7. Script of *Smoking Teeth* with references
8. *Smoking Teeth DVD*
9. *How Mercury Causes Brain Degeneration DVD*
10. Amalgam studies: Disregarding basic principles of mercury toxicity J. Mutter
11. Dental Personnel Mercury Injury
12. Material safety data sheet for Dispersalloy 1995
13. Testimony before the House Committee on Government Reform San Francisco Regional Water Quality Control Board Director Shah
14. Mercury in Dental Amalgam_A Neurotoxic Risk Herbert Needleman
15. Testimony by Philippe Grandjean, Mercury MACT Rule Hearing Augusta Maine 2004
16. Alzheimer Disease: Mercury as pathogenic factor and apolipoprotein E as a moderator J. Mutter

IAOMT Print Submissions

17. Public Health and Economic Consequences of Methyl Mercury toxicity of the developing Brain L. Trasande
18. Reduced Levels of Mercury in first Baby Haircuts of Autistic Children A. Holmes
19. Dental Amalgam and Mercury levels in Autopsy Tissues G. Guzzi
20. Early Downward Trends in Neurodevelopmental Disorders Following Removal of Thimerosal-Containing Vaccines D. Geier
21. Mercury Induced Alzheimer's Disease: Accelerating Incidence? J. Ely
22. The association between a genetic polymorphism of coproporphyrinogen oxidase, dental mercury exposure and neurobehavioral response in humans D. Echeverria
23. Critique of the Children's Amalgam Study (CAT) Consent Forms S. Duffy
24. Proposed Accurate Informed Consent for CAT
25. Ethical Complaints and Scientific Facts of CAT
26. Critique of the CAT methodology D. Kennedy
27. Critique of CAT B. Haley
28. Press Release Regarding the Ethical Complaints CAT
29. Neurobehavioral Effects of Dental Amalgam in Children T. DeRouen
30. Neuropsychological and Renal Effects of Dental Amalgam in Children D. Bellinger

IAOMT Print Submissions

- **20 Years of funding Peer Scientific Research has produced a prodigious body of empirical evidence**
- Vimy MJ, Lorscheider FL: Intra-oral air mercury released from dental amalgam. J Den Res 64:1069-71, 1985 Murray Vimy <drvimy@shaw.ca>
  http://www.ncbi.nlm.nih.gov/sites/entrez?cmd=Retrieve&db=PubMed&list_uids=3860538&dopt=Abstract
  First they measured the intra-oral levels of mercury generated using a standardized technique.
- Vimy MJ, Lorscheider FL: Serial measurements of intra-oral air mercury: Estimation of daily dose from dental amalgam. J Dent Res 64(8):1072-5, 1985. Murray Vimy <dr.vimy@shaw.ca>
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=3860539&dopt=Abstract
  Next they measured these levels over time and found that they slowly drop back to baseline after 90 minutes.
- Vimy MJ, Luft AJ, Lorscheider FL. Estimation of Mercury Body Burden from Dental Amalgam Computer Simulation of a Metabolic Compartment Model J. Dent. Res 1986 65(12):1415-1419, December. 1986 Murray Vimy <dr.vimy@shaw.ca>
  http://www.ncbi.nlm.nih.gov/sites/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=3465721&dopt=Abstract
  Then they used a computer simulation to determine what body burden they would likely produce.
- Hahn LJ ; Kloiber R; Vimy MJ; Takahashi Y; Lorscheider F; Dental "silver" tooth fillings: a source of mercury exposure revealed by whole-body image scan and tissue analysis. FASEB J. 3:2641-2646; 1989 Murray Vimy <dr.vimy@shaw.ca>
  http://www.fasebj.org/cgi/content/abstract/3/14/2641
  The Calgary Medical School felt that further human experimentation might unnecessarily expose experimental subjects to excessive levels of mercury so our work turned to animals. The sheep is the most common obstetric mammal. The first experiment with sheep was a distribution tracer study that found out where the mercury spread to once released from the fillings.

IAOMT Print Submissions

- Vimy M. Hahn LJ. Klober R Takahashi Y, Lorscheider FL. Mercury uptake in sheep fetus from dental fillings, 32nd Annual Meeting of the Canadian Federation of Biological Societies 14-17 June 1989 and 2nd Meeting of the International Society for Trace Element Research in Humans 8/89 Murray Vimy <dr.vimy@shaw.ca>
  The next experiment looked at spread of mercury from installed amalgam fillings into a fetus since the fetus is the most vulnerable to harm from heavy metal exposure during development.
- Summers, A.O.; Wireman, J.; Microbiology Department University of Georgia: Vimy, M.J.: Lorscheider, F.L. Department of Medicine and Physiology, University of Calgary, Alberta, Canada Increased mercury resistance in monkey gingival and intestinal bacterial flora after placement of dental "silver" fillings abstract The Physiologist 8/15/90 Email: Ann Summers <summers@arches.uga.edu>
  Dr. Summers contacted the research team in Calgary and asked to participate in the next project. She found that installing amalgam fillings in wild caught monkeys caused antibiotic resistant organisms to develop in the intestinal flora within two weeks.
- Hahn, Leszek J.; Kloiber, Reinhard; Leininger, Ronald W.; Vimy, Murray J.; & Lorscheider, Fritz L. Whole-body imaging of the distribution of mercury released from dental fillings into monkey tissues. FASEB, Vol. 4, Nov. 1990, pp. 3256-3260
  http://www.fasebj.org/cgi/content/abstract/4/14/3256. Murray Vimy <dr.vimy@shaw.ca>
  The Calgary Medical School team repeated the amalgam mercury distribution study and found that primates spread the mercury from amalgam just like sheep.
- Vimy M.J., Boyd N.D., Hooper D.E. and Lorscheider F.L., Glomerular filtration impairment by mercury released from dental "silver" fillings in sheep. Department of Medicine, Pathology, and Physiology, University of Calgary, Alberta, Canada. Abstract The Physiologist August 15, 1990 Murray Vimy <dr.vimy@shaw.ca>
  Measurements of sheep kidney function found a 60% drop in inulin clearance. This is a clear sign that amalgams impacted kidney function in the sheep.
- Vimy, MJ; Takahashi, Y; Lorscheider, FL Maternal-fetal distribution of mercury (203 Hg) released from dental amalgam fillings the American Physiology Society 0363-6119/90 R939-945 Murray Vimy <dr.vimy@shaw.ca> In this complex experiment twin sheep fetuses mercury blood levels were measured both during development and after birth. They found that mercury transferred across both the placental membrane prenatally and into the milk postnatally.

IAOMT Print Submissions

- Lorscheider, Fritz L. Ph.D. Murray J. Vimy, D.M.D. Department of Physiology and Medicine Faculty of Medicine, University of Calgary, Alberta T2N 4N1Canada Mercury exposure from 'silver' fillings. The Lancet. Vol. 337, May 4, '91. p. 1103. Murray Vimy <dr.vimy@shaw.ca> This article is a point by point review of mercury from amalgam exposure.
- Summers, A.O.;Vimy, M.J.: Lorscheider, F. University of Georgia, Athens, GA. USA & University of Calgary Medical School, Calgary, Alberta, Canada "Silver" dental fillings provoke an increase in mercury and antibiotic resistant bacteria in the mouth and intestines of primates. The Alliance for Prudent Use of Antibiotics Vol. 9 No. 2 Fall 1991 Murray Vimy <dr.vimy@shaw.ca> Email: Ann Summers <summers@arches.uga.edu> Professor Summers reports her additional research into the antibiotic resistance in primates that amalgam produce.
- Boyd, N.D.;Benediktsson, H.;Vimy, M.J.; Hooper, D.E.;Lorscheider, F.L. Mercury from dental "silver" tooth fillings impairs sheep kidney function The American Physiological Society 0363-6119 P.R1010-R1014 11/1991 http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1928419&dopt=Abstract
  The damage to the sheep's kidney from amalgam was given before the American Physiological Society.

Dufe, E; Pendergrass, C; Kasarskis, E; Slevin, J; Haley, B. Hg2+ Induces GTP-Tubulin Interactions in Rat Brain Similar to Those Observed in Alzheimer's Disease. Federation of American Societies for Experimental Biology (FESAB). 75th Annual Meeting. Atlanta, GA 21-25 April 1991. Abstract 493 http://www.allergycentral.com/MultiInformationLibrary.htm
  Email: "Boyd E. Haley" <bhaley@uky.edu> Curt Pendergrass <gpender@allergycentral.com>
  Dr. Haley's team found they could reproduce all of the 7 histological hallmark signs of Alzheimer's Disease only by using inhaled elemental mercury vapor. This is the form that comes off amalgam.

- Ziff, MF. Documented Clinical Side-Effects to Dental Amalgam. Adv Dent Res, 6:131-4, 1992
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1292834&dopt=Abstract
  Dr. Ziff reported an extensive list of diseases that have been linked to amalgam in the peer reviewed scientific literature including periodontal diseas

IAOMT Print Submissions

- Lorscheider, Fritz and Vimy, Murray Evaluation of the safety of mercury released from dental fillings. FASEB Journal Vol. 7 Dec. 1993 Murray Vimy <dr.vimy@shaw.ca>>
- This is the first editorial ever published in the prestigious journal FASEB. It was by invitation of the editor since the earlier animal research published in FASEB had raised so much invalid criticism from the dental organizations.
- Summers, A.O., Wireman, J., Vimy, M.J., Lorscheider, F.L. Marshall, B., Levy, S.B., Bennett, S., and Billard, L. Mercury released from dental "silver" fillings provokes an increase in mercury and antibiotic resistant bacteria in primates oral and intestinal flora. Antimicrobial Agents and Chemotherapy, Vol. 37 pp. 825-834, 1993 Email: Ann Summers <summers@arches.uga.edu> Murray Vimy <dr.vimy@shaw.ca> Dr. Summers continues to refine and define the findings of antibiotic resistance in animals and humans exposed to amalgam fillings.
- J Wireman, CA Liebert, T Smith and AO Summers Association of mercury resistance with antibiotic resistance in the gram-negative fecal bacteria of primates. Appl. Environ. Microbiol., Nov 1997, 4494-4503, Vol 63, No. 11 http://aem.asm.org/cgi/content/abstract/63/11/4494 Dr. Wireman confirms the earlier research of Dr. Summers.
- Palkiewicz, Pawel; Zwiers, Henk & Lorscheider, Fritz ADP-Ribosilation of Brain Neuronal Proteins Is Altered by In Vitro and In vivo Exposure to Inorganic Mercury Joirnal of Neurochemistry 62, 2049-2052 1994 http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8158153&dopt=Abstract Palkiewicz finds that mercury can produce the neurochemical lesions of Alzheimer's Disease both in the test tube and in live animals.
- Status Quo and Perspectives of amalgam and other Dental Materials, International Symposium Proceedings Friberg, LT; Schraizer, G.N. eds Georg Thieme Verlag Stuttgart – New York 1995 ISBN 3-13-102471-2 1994

IAOMT Print Submissions

- The German Department of Health had banned amalgam use in women and children following the International Academy of Oral Medicine and Toxicology in Dusseldorf in 1992. Members of the dental profession protested that they hadn't been given an opportunity to present their evidence of safety. This conference consisted of 25 presenters and 2 moderators who are experts in mercury. The peer reviewed conclusions supported the German ban on exposure of children and women of childbearing age to mercury from amalgam. 6 members of the IAOMT participated in this historic conference:
- 1. D C Kennedy Biocompatible Restorative Dentistry Email: david@kennedy.ddcfront.net
- 2. R E Haley & J C Pendergrass Mercury-EDTA Complex Specifically Blocks Brain b-Tubulin GTP Interactions: Similarity to Observations in Alzheimer's Disease Email: "Boyd E. Haley" <bhaley@uky.edu>
- 3. F L Lorscheider Mercury Exposure from "Silver" dental Fillings: Current Research Findings about Uptake, Tissue Distribution, and Pathophysiology
- 4. M F Ziff Dental amalgam: Status Quo, Political Aspects, International Situation
- 5. D J Pleva Mercury Release From Dental Amalgam
- 6. Masi, J. V. Corrosion of amalgams in restorative materials: the problem and the promise. James Masi <jmasi@uoc.edu>
- Toxic Teeth: Chronic Mercury Poisoning of Modern Man, Vimy Chemistry and Industry p 14-17 1/95
  Murray Vimy <dr.vimy@shaw.ca>
- Echeverria, D.; Aposhian, H.V.; Woods, J.S.; Heyer, NJ; Aposhian MM; Bittner, AC; Jr; Mahurin, RK; Cianciola, M., Neurobehavorial effect from exposure to dental amalgam Hg0: New distinctions between recent exposure and Hg body burden FASEB J., Vol. 12 pp. 971-980, 1998 http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9707174&dopt=Abstract This research team in a series of experiments has measured significant neurological impairment in amalgam bearers and dental personnel as well as mercury-free dentists.
- Vimy MJ, Hooper DE, King WW, Lorscheider FL . Mercury from Maternal "Silver" Tooth Fillings in Sheep and Human Breast Milk. Biological Trace Element Research Vol. 56, 1997 http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9164660&dopt=Abstract The Calgary research team demonstrated that mercury from amalgam enters both animal and human milk and, therefore, poses a significant risk to infants.

IAOMT Print Submissions

- Leong CCW, Syed NI, Lorscheider FL. Retrograde Degeneration of Neurite Membrane Structural Integrity of Nerve Growth Cones Following in vitro Exposure to Mercury NeuroReport Vol. 12 #4, 2001 You can watch this video and animation on the IAOMT web site at www.iaomt.org) The video from this research shows that the introduction of 100 times less mercury than found in the cerebral spinal fluid of amalgam bearers into a cell culture of growing nerve cells immediately halts growth and produces neurofibrillary tangles similar to those seen in Alzheimer's Disease.

- WHO Environmental Health Criteria 118: Inorganic Mercury. World Health Organization, Geneva, 1991
  http://www.inchem.org/documents/ehc/ehc/ehc118.htm
  Dental amalgam is the predominant source of human exposure to mercury.
  human daily dose of mercury from various sources is:

Dental amalgam	= 3.0–17.0μg/day (Hg vapor)
Fish and Seafood	= 2.3 μg/day (methylmercury)
Other food	= 0.3 μg/day(inorganic Hg)
Air & Water	= Negligible traces

  "A specific no-observed–effect level (NOEL) cannot be established"

- In 1991 Dr. Murray Vimy our founder participated in the WHO assessment of the daily dose received from amalgam in Genoa, Italy. The conclusions of this expert ad hoc committee are now in the Criteria document 118. Email: Murray Vimy <drvimy@shaw.ca>