

assessing female exposure to mercury occupationally. These observations suggest that further studies and preventive measures are warranted.

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**Mercury Release from Dental Amalgams Into Continuously Replenished Liquids.**

Okabe, T; Elvebak, B; Carrasco, L; Ferracane, JL; Keanini, RG; Nakajima, H.

Dental Materials, 19(1):38-45, Jan 2003.

**ABSTRACT: Objective:** Studies have been performed using high- and low-copper amalgams to measure the amounts of mercury dissolution from dental amalgam in liquids such as artificial saliva; however, in most cases, mercury dissolution has been measured under static conditions and as such, may be self-limiting. This study measured the mercury release from low- and high-copper amalgams into flowing aqueous solutions to determine whether the total amounts of dissolution vary under these conditions when tested at neutral and acidic pH.

**Methods:** High- and low-copper amalgam specimens were prepared and kept for 3 days. They were then longitudinally suspended in dissolution cells with an outlet at the bottom. Deionized water or acidic solution (pH 1) was pumped through the cell. Test solutions were collected at several time periods up to 6 days or 1 month and then analyzed with a cold vapor atomic absorption spectrophotometer. After dissolution testing, the specimens were examined using SEM/XEDA for any selective degradation of the phases in the amalgam.

**Results:** Except for the high-copper amalgam in the pH 1 solution, the dissolution rates were found to decrease exponentially with time. The rate for the high-copper amalgam in pH 1 solution slowly increased for 1 month. The total amounts of mercury released over 6 days or 1 month from both types of amalgam in deionized water were not significantly different. The high-copper amalgam released significantly more mercury than the low-copper amalgam in the pH 1 solution at both time periods. For both amalgams, the dissolution in pH 1 was significantly higher than in deionized water.

**Significance:** Mercury dissolution from amalgam under dynamic conditions is enhanced in an acidic media, and most prominently for a high-copper formulation.

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**FORUM**

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**IAOMT 2003 ANNUAL MEETING**

**Date:** 11-13 September 2003.

**Fundamentals Courses:** Thursday, 11 Sep. 2003, 8:30 am - 5:30 pm.

**Site:** New Orleans, Louisiana.

**Hotel:** Wyndham New Orleans at Canal Place, 100 Rue Iberville, New Orleans, LA 70130. T: 504-566-7006. Specify **IAOMT**. Room rate/night (s/d): \$159 Deadline for IAOMT block: 14 Aug 2003.

**Meeting Registration:** IAOMT, P.O. Box 608531, Orlando, FL. 32860-8531. T: 407- 298-2450; F: 407-298-3075.

**Welcome Reception:** Thur, 11 Sept 2003, 7:30-10:00 pm.

**Program:** Stanislaw Burzahnski, MD, PhD: "Anti-Aging and Cancer."

Stephanie Cave, MD: "Autism, Vaccines and Mercury Dental Fillings."

Paul G. Harch, MD: "Hyperbaric Oxygen Therapy and SPECT Brain Imaging in the Treatment of Chronic Brain Injury."

Harold Kristal, DDS: "Dentistry, Diet and Metabolic Nutrition."

Phyllis Mullenix, PhD: "Neurotoxicology of Fluoride."

**Thursday Fundamentals Courses:**

Richard Chanin, DDS: "Fundamentals of Biological Dentistry." Marcia Basciano, DDS: "Equipment For the Biological Dental Practice."

David Kennedy, DDS: "Introduction to Biological Periodontal Therapy and Fluoride Problems."

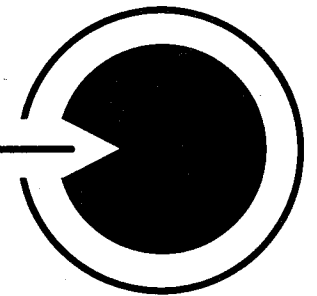
**Reservations through IAOMT office required.**

If you are a mercury-free dentist or are contemplating going mercury-free, you need to be in the IAOMT! The IAOMT has been a leader in striving for biological dentistry; funding research and stimulating regulatory activity. Further, the IAOMT - with a membership of dentists, physicians, and medical research scientists - is instrumental in education and the development of sound protocols and practice standards.

For membership information, contact: IAOMT, P.O. Box 608531, Orlando, FL 32860-8531; T: 407-298-2450; F: 407-298-3075; email: mziff@iaomt.org

**BIO-PROBE**

**NEWSLETTER**



**AMALGAM BREAKTHROUGH IN SWEDEN!**

[BP Note: The following translations were provided by Mats Hanson, PhD and Maryanne Rygg. The full report in Swedish can be found at: [www.dentalmaterial.gov.se](http://www.dentalmaterial.gov.se)]

On 26 April 2003, the following headline appeared in *Dagens Nyheter*, the leading newspaper in Sweden: "Expert Consulted For Amalgam Study Demands Amalgam Ban."

The expert cited was Maths Berlin, PhD, one of the foremost experts in the world on mercury toxicology. The Swedish government had selected Dr. Berlin to provide a risk assessment on amalgam and other dental materials. This was called the "Swedish Dental Materials Study."

The following are quotes from Dr. Berlin: "Amalgam hazards are underestimated. The margin of safety which researchers thought to be present does not exist. Sensitive persons can be damaged because of mercury in their mouths."

Dr. Berlin went on to say: "I think that amalgam as soon as possible should be banned in the whole European Union. Every medical doctor and dentist should consider whether mercury from amalgam could be a contributing factor when they encounter patients with unclear diseases and diseases which involve the immune system. Regarding the risk for retardation of brain development, it is not in accordance with scientific knowledge and standard of care to

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place amalgam fillings in children or in fertile women." "Mercury is a multipotent poison with effects on several levels of cell function and therefore unsuitable as a dental filling material."

Dr. Hanson commented that to practice contrary to science and the standard of care is considered quackery and leads to disciplinary action!

The newspaper article noted that dental amalgam is still not banned in Sweden, despite the fact that it contains the toxic and environmentally dangerous heavy metal mercury. Sweden cannot implement a ban until all of the European Union agrees.

[BP Note: Mats Hanson, PhD has graciously provided the following explanation of the significance of this recent event in Sweden.]

Amalgam has been evaluated at least five times by the Health and Welfare Board (Socialstyrelsen) since 1981. In 1986 the conclusion was that amalgam was a toxicologically unsuitable filling material and restriction on its use in pregnant women was introduced (credit to L. Friberg).

The next three evaluations added nothing but appeals to doctors and dentists that patients should be met with respect but since the message between lines was that patients who claimed amalgam had made them sick in reality had psychosomatic problems, most patients were still met with disrespect and given no help.

Two years ago a new dental insurance system was introduced by the Dept. of Health. Amalgam was removed from the subsidized materials and money was allocated to the medical system allowing free removal of amalgam if the patient claimed problems from amalgam. No proofs were required, only a treatment plan from a dentist and a medical examination. The medical doctor did not have to believe in "amalgam disease" but only to regularly check-up the patient. In practice, the county medical and dental boards have in every way tried to dissuade doctors, dentists and patients from using this possibility and introduced a number of bureaucratic obstacles.

In 2002, the Government realized something had to be done after 20 years of evaluations by the Health and Welfare Board without results and public and political pressure and started a new evaluation at the Dept. of Health. It is very

unusual that a government department takes over a matter from an administrative board.

The new evaluation will consider dental materials in general but starting with amalgam and how patients who consider themselves sick from amalgam fare in the health care system. A safety evaluation of dental amalgam has just been published (25 April 2003). Prof. Maths Berlin, former WHO leading expert on effects of mercury, was given the task of evaluating amalgam risks. The evaluation was presented on the front page of Dagens Nyheter, leading Swedish newspaper on 26 April 2003.

The evaluation has stimulated a number of other studies which will be included in the final product, expected in late May or early June: An investigation of how patients are informed of their rights at the counties medical boards, how many get free amalgam removal, reasons for refusing, an opinion poll to doctors and dentists, a review of the situation in other countries, a review of all available studies on results of amalgam removal, a questionnaire to 1000 patients.

In addition there will be plans for further studies, education of dentists and doctors etc. As a start, the Metal Biology Center in Uppsala has been given 15 mill. Swedish crowns to evaluate and publish all medical data from the patients who were treated at the former Amalgam Unit, Uppsala.

From my own point of view it is satisfying that 22 years fight for all patients finally seems to result in a radical change. In 1981, after my whistle blowing, I optimistically thought that everyone will immediately understand this severe problem and take action to correct the situation. It did not proceed quite as fast as expected!

However, we are very satisfied with the current evaluation and cooperate as best we can and for the first time do not feel that we are in opposition. Some dentists are not that satisfied.

Mats Hanson

**Bio-Probe Comment:** What a difference! More and more countries are issuing warnings and

experiments the L2 cells were incubated with the same compounds for 6-48 h. LDH release was measured and the values were expressed as percentage of the LDH content. The values were plotted on a concentration log-scale and the substance concentration at the maximum slope was assessed as effective concentration (EC50). **Results:** A significant ( $p < 0.05$ ) increase in LDH release was found in the L2 cells after 8-h incubation with HEMA (4 mmol/l), TEGDMA (2 mmol/l) an, MeHgCl (0.01 mmol/l) and HgCl<sub>2</sub> (0.015 mmol/l), and in A549 cells with HEMA (14 mmol/l), TEGDMA (15 mmol/l), MeHgCl (0.15 mmol/l) and HgCl<sub>2</sub> (0.05 mmol/l), compared to controls. The EC50 values from compounds in the L2 cells are shown in the following table [Ed Note: Not with abstract.]

**Significance:** The toxic effect of HgCl<sub>2</sub> and MeHgCl from the L2 cells was about 100-700 fold higher than of the dental composite components. A significant ( $p < 0.05$ ) time dependent increase of toxicity was observed with TEGDMA, HEMA and MeHgCl.

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***Infertility, Blood Mercury Concentrations and Dietary Seafood Consumption: A Case-Control Study.***

Choy, CM; Lam, CW; Cheung, LT; Briton-Jones, CM; Cheung, LP, Haines, CJ.

Brit J Obst Gyn, 109(10):1121-5, Oct 2002.

**ABSTRACT: Objective:** To compare blood mercury concentrations of infertile couples with those of fertile couples in Hong Kong, and to examine the relationship between blood mercury concentrations and seafood consumption.

**Design:** Case-control study.

**Setting:** In vitro fertilization (IVF) Unit and Antenatal Unit of a university teaching hospital. Sample one hundred fifty-seven infertile couples attending IVF treatment and 26 fertile couples attending antenatal care without known occupational exposure to mercury.

**Methods:** Mercury concentrations in whole blood

were measured by cold vapour atomic absorption spectrophotometry. A dietitian recorded the quantity of seafood consumption among infertile couples via a food-frequency questionnaire. Blood mercury concentrations and quantity of seafood consumption were compared between infertile and fertile couples.

**Main Outcome Measures:** Whole blood mercury concentrations, quantity of seafood consumption.

**Results:** Infertile couples had higher blood mercury concentrations than fertile couples. 'Infertile males with abnormal semen' and 'infertile females with unexplained infertility' also had higher blood mercury concentrations than their fertile counterparts. Blood mercury concentrations were positively correlated with quantity of seafood consumption. Infertile subjects with elevated blood mercury with elevated blood mercury concentrations consumed a larger amount of seafood.

**Conclusion:** Higher blood mercury concentration is associated with elevated blood mercury concentrations in our infertile population.

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***Effects of Metallic Mercury on the Perimenstrual Symptoms and Menstrual Outcomes of Exposed Workers.***

Yang, JM; Chen, QY, Jiang, XZ.

Am J Indust Med, 42(5):403-9, Nov 2002.

**ABSTRACT: Background:** Mercury is an important environmental and industrial pollutant and its effect on perimenstrual symptoms and menstrual outcomes is unclear.

**Methods:** A retrospective epidemiological investigation was conducted on 296 female workers exposed to mercury vapor and 394 female workers from food processing plants. Both groups included women of 19-44 years of age currently working since last at least 1 year when studied. Women who were currently pregnant, using oral contraceptives (Ocs), an intrauterine device (IUD), and steroid hormones were excluded.

**Results:** The air concentration of mercury in the workplace ranged from 0.001-0.200 mg/m<sup>3</sup>. The prevalence of abdominal pain in the exposed group was significantly higher than that in the control group (OR = 1.66, 95% CI is 1.07-2.59).

**Conclusions:** An increased prevalence of abnormal menstruation was found in mercury-exposed workers in China. Dysmenorrhea may be a useful biomarker for

could then be very dramatic. It is time for the dental profession and government officials to wake up and started paying attention!

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**Oral Lichenoid Reactions Associated With Amalgam: Improvement After Amalgam Removals.**

Dunshe, A; Kastel, I; Terheyden, H; Springer, IN; Christophers, E; Brasc.

Brit J Dermatol, 148(1):70-6, Jan 2003.

**ABSTRACT: Background:** The pathogenetic relationship between oral lichenoid reactions (OLR) and dental amalgam fillings is still a matter of controversy.

**Objectives:** To determine the diagnostic value of patch tests with amalgam and inorganic mercury (INM) and the effect of amalgam removal in OLR associated with amalgam fillings.

**Methods:** In 134 consecutive patients 467 OLR lesions were classified according to clinical criteria. One hundred and fifty-nine biopsies from OLR lesions were histologically diagnosed according to the World Health Organization criteria for oral lichen planus (OLP) and compared with OLP lesions from edentulous patients without amalgam exposure. One hundred and nineteen patients were patch tested with an amalgam series. In 105 patients (357 of 467 lesions) the amalgam fillings were removed regardless of the patch test results and OLR were re-examined within a follow-up period of about 3 years. Twenty-nine patients refused amalgam removal and were taken as a control group.

**Results:** Eleven patients with OLR (8.2%) had skin lesion lichen planus (LP). Histologically, the lesions in the OLR group could not be distinguished from those seen in the OLP group. Thirty-three patients (27.7%) showed a positive patch test to INM or amalgam. Amalgam removal led to benefit in 102 of 105 patients (97.1%), of whom 31 (29.5%) cleared after removal of amalgam, whereas 65 (18.2%) did not improve. In the control group without amalgam removal (n= 29) only two patients (6.9%)

showed an improvement.

Amalgam removal had the strongest impact on lesions of the tongue compared with lesions at other sites ( $P < 0.05$ ), but had very little impact on intraoral lesions in patients with cutaneous LP compared with patients without cutaneous lesions ( $P < 0.05$ ). Patients with a positive patch test reaction to amalgam showed complete healing more frequently than the amalgam-negative group. After an initial cure following amalgam removal, 13 lesions (3.6%) in eight patients (7.6%) recurred after a mean of 14.6 months.

**Conclusions:** Of patients with OLR associated with dental amalgam fillings, 97.1% benefitted from amalgam removal regardless of patch test results with amalgam or INM. We suggest that the removal of amalgam fillings can be recommended in all patients with symptomatic OLR associated with amalgam fillings if no cutaneous LP is present.

**Bio-Probe Comment:** That is quite a success rate (97.1%) for ANY therapy! The authors, from a Department of Oral and Maxillofacial Surgery of a University in Germany, actually "recommended" removal of amalgam fillings as a treatment choice.

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**Cytotoxicity of Dental Composite Components and Mercury Compounds in Lung Cells.**

Reichl, F; Walther, UI; Durner, J; Kehe, K; Hickel, R; Kunzelmann, K; Spahl, W; Hume, WR; Benschop, H; Forth, W.

Dental Materials, 17(2):95-101, Mar 2001.

**ABSTRACT: Objective:** The effect of dental composite components triethyleneglycoldimethylacrylate (TEGDMA) and hydroxyethylmethacrylate (HEMA), as well as mercuric chloride ( $HgCl_2$ ) and methylmercury chloride ( $MeHgCl$ ) was investigated on the release of lactatedehydrogenase (LDH) from alveolar epithelial lung cell lines in vitro.

**Methods:** The confluent layers from the A549 (human, malignant) and the L2 cells (rat) were incubated with various concentrations of HEMA, TEGDMA,  $MeHgCl$  and  $HgCl_2$  at 37 degrees C in 2% (v/v)  $CO_2$  atmosphere for 8h. In further

guidelines on restricting the use of mercury amalgam dental fillings while, in the United States, government authorities and organized dentistry steadfastly insist that the continuous exposure to mercury from dental amalgam is harmless. How long can this continue before the United States pays attention?

This government report from Sweden is yet another official "Risk Assessment" on mercury exposure from dental amalgam, all of which acknowledge a risk. This is the proper way to evaluate these toxins, rather than declaring them harmless because it has not been "proven" that they cause MS or Alzheimer's Disease or some other entity. U. S. officials, and courts, had better stop relying on the unsubstantiated opinions of organized dentistry and their allies!

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**Norway Issues Guidelines On Dental Restorative Materials**

**[BP Note:** The following are excerpts of an unofficial translation provided by Maryanne Rygg. As a representative of the patient group in Norway, Ms. Rygg was a Participant in the Working Group of the Norwegian Board of Health. Only items of interest to mercury amalgam fillings are herein presented. The full document of 39 pages is in Norwegian, and can be found at [www.shdir.no/index.db2?id=3948](http://www.shdir.no/index.db2?id=3948)]  
**"Guidelines for the Use of Dental Restorative Materials (in Norway)"** was issued by the Norwegian Directorate for Health and Social Welfare; 17 March 2003.

**Short Version; Recommendations:**

- Amalgam shall not ordinarily be the first choice when filling therapy is indicated.
- The use of amalgam shall be limited as much as possible in order to protect the environment and due to possible injury to health.
- For new restorations, contact between amalgam and other metals should be avoided.
- Efforts should be made to reduce exposure of patients and dental personnel to chemical

substances from dental therapy when applying and removing fillings.

**Conclusions of the Directorate for Health and Social Welfare:**

1. From an environmental and a public health point of view, it is desirable to reduce mercury exposure in the population. The Directorate for Health and Social Welfare recommends that the use of amalgam as a dental restorative material be reduced.
2. These guidelines do not involve a ban against the use of amalgam, but dentists are encouraged to reduce the use of amalgam.
3. The guidelines do not imply a recommendation for removal of existing amalgam fillings in persons that do not have symptoms in connection with the fillings. **[BP Comment:** Notice that this specifies for patients that "do not" have symptoms. Would removing amalgams from patients that do have symptoms then be acceptable, if not encouraged?]
4. Special and weighty reasons must exist for use of amalgam for children and youth.
5. When odontological indications exist for replacing a filling in an adult, a material other than amalgam should be used. In a case where a patient chooses amalgam as a dental restorative material, this should be accepted.

**Release of Mercury From Amalgam Fillings:**

[This section of the document includes references.]  
*"It is known that mercury in high doses leads to health damage such as disturbances in brain function, kidney function, the immune system and fetus development."*

**"No limit has been established for safe/harmless influence. Sub-clinical effects have, however, been shown at doses equaling those which some persons can receive from amalgam fillings."**

[BP emphasis.]

*"There have been reports of persons who have had a high level of mercury in blood/urine due to intense chewing of gum while attempting to quit smoking. Considerably lower amounts of mercury have been found after removal of fillings from*

some of the same people." [BP Comment: Five references for this. Yet another documented reason to remove amalgam fillings.]

"During the last 10-15 years, documentation has become available showing that mercury from amalgam fillings is traced in locations in the human body where it is unwanted. It has been shown that the amount of mercury in the brains of deceased persons correlates with their number of amalgam fillings."

"Mercury passes through the placenta, and the mercury concentration of fetuses correlates with the number of amalgam fillings in their mothers. The amount of mercury in breast milk increases with increasing numbers of amalgam fillings in the mother." [BP Comment: It is absolutely a disgrace that government officials have ignored this particular research!]

"It has been reported that a majority of those who assume that their health problems are due to amalgam fillings experience an improvement in their health after removal of amalgam fillings, but this is a complex area where cause and effect mechanisms have not been clarified." [BP Comment: Apparently, government officials in the United States do not consider improvement in human health is important, unless such health improvement is endorsed by the establishment!]

"The margin of safety between the mercury burdens some persons with amalgam fillings experience and the burden that can set off illness is small."

[BP Comment: These statements by the Health Departments of the governments of Norway and of Sweden (previous article), supported by published documentation, are so dramatic as to demand immediate attention from responsible government officials worldwide. ENOUGH ALREADY!]

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SCIENCE

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### Mercury in Brain Tissue of Infants

Eggleston, DW; Malmstrom, C; Nylander, M.

<http://home.swipnet.se/misac/forskning6.html>

[BP Note: This site contains the cited Tables and References.]

Necropsy studies clearly showed higher mercury (Hg) concentrations in bulk tissue of brain stem tissue from 26 infants compared with brain tissue of the occipital lobes from 21 adults of the same population in California, USA (Table 1).

Preliminary data of adults do not indicate higher tissue levels of Hg in brain stem compared to occipital tissue [1]. Tissue samples were also analyzed from kidneys and liver in three and from spleen in two of the infants. Mercury concentration in one of the kidneys was very high (1370 ng Hg/g wet weight), higher than normally seen in adults even with dental amalgam fillings.

The 26 infants ranged in age from death at birth to 15 months and 18 died from Sudden Infant Death Syndrome (SIDS), and 8 from other causes such as congenital heart defects, respiratory insufficiency, pneumonia and blunt force.

A U.S.-Swedish study of 83 Californian adults, including the same adults as in the present study, showed that the number of tooth surfaces containing amalgam was significantly correlated with Hg concentrations in the occipital cortex [2]. Several other international studies have reported significant correlations between dental amalgam and brain tissue, pituitary gland, and renal tissue [1, 3, 4, 5]. Elemental Hg vapor is continuously released from amalgam fillings, and increases by mastication, tooth brushing and bruxism [6, 7, 8]. Higher levels of Hg are emitted during insertion or removal of amalgam fillings [9, 10]. Vimy et al [1989, 11] showed uptake and distribution of radioactive labeled Hg from amalgam placed in sheep demonstrating a considerable release of Hg from the amalgam fillings in the mother and a transfer and accumulation to the fetus organs including brain, kidneys and liver.

Of particular importance is the redistribution of Hg

from the liver to the brain and kidneys after delivery, showed in guinea pigs [12].

The World Health Organization (WHO) has recommended that "the exposure of women in childbearing age to Hg vapor should be as low as possible [13]." Data about the toxicity of human fetal exposure to elemental Hg is sparse [13].

As the major source of Hg to humans with amalgam fillings are from their fillings [13, 14], the influence of mercury from amalgam fillings should be fully investigated.

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### Fluoridation: A Violation of Medical Ethics and Human Rights.

Cross, DW; Carton, RJ.

Int J Occup Environ Health, 9:24-29,2003.

ABSTRACT: Silicofluorides, widely used in water fluoridation, are unlicensed medical substances, administered to large populations without informed consent or supervision by a qualified medical practitioner. Fluoridation fails the test of reliability and specificity, and, lacking toxicity testing of silicofluorides, constitutes unlawful medical research.

It is banned in most of Europe; European Union human rights legislation makes it illegal. Silicofluorides have never been submitted to the U.S. FDA for approval as medicines. The ethical validity of fluoridation policy does not stand up to scrutiny relative to the Nuremberg Code and other codes of medical ethics, including the Council of Europe's Biomedical Convention of 1999. The police power of the State has been used in the United States to override health concerns, with the support of the courts, which have given deference to health authorities.

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### Effects of Small Concentrations of Mercury on the Contractile Activity of Rat Ventricular Myocardium.

Souza de Assis G; C. Silva C; Stefanon I; Vassallo D. Comp Biochem Physiol C Toxicol Pharmacol, 134(3):375-83, Mar 2003.

ABSTRACT: Personal exposure to mercury vapor and the release of mercury from or during removal of amalgam fillings increases its blood and plasma concentration. However, it is not known if these very small amounts affect cardiac function. The effects of continuous exposure to 5 and 20 nM of HgCl(2) on the cardiac contractility were investigated in isometric and tetanic contractions of right ventricular strips and in Langendorff perfused rat hearts.

The continuous exposure for 2 h produced a small but significant reduction of the isometric twitch force and time to peak tension shortened. Relative post-test potentiation was not affected by this concentration of HgCl(2) suggesting a lack of action of the metal on the sarcoplasmic reticulum activity. Tetanic tension, in contrast to twitch force, was intensively reduced suggesting an important depressant action on the activity of contractile proteins.

In perfused hearts beating spontaneously, isovolumic systolic pressure reduced progressively and the diastolic pressure increased. Although occurring heart rate reduction, it was similar for both controls and mercury treated hearts. Also, time dependent changes in coronary perfusion pressure were similar to controls.

Results suggested that cardiac effects may be observed after continuous exposure to very small concentrations of mercury, probably as a result of the cell capacity to concentrate mercury. These results also indicate that continuous professional exposure to mercury followed by its absorption might have toxicological consequences affecting cardiac function, and being considered hazardous.

**Bio-Probe Comment:** This important study adds additional published evidence to the compelling list demonstrating the cardiotoxic effects of mercury [see: [www.bioprobe.com](http://www.bioprobe.com)] Further, this study shows the effects at very small doses of mercury consistent with removal of amalgam fillings. What happens if dentists do not exercise extreme caution in removing amalgams? The cardiotoxic effects