Selected Abstracts and Excerpts for Mercury 101 and 102

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Abstract: The highest levels of mercury in breath measured in this study (fig 1a) are comparable with threshold limit values established in some countries, and exceed the probable safe limits for continuous exposure of the general population, as suggested by some workers. We therefore conclude that the levels of elemental mercury in breath derived from silver-tin amalgam fillings represent a significant and undesirable contribution to mans 'normal' body burden of mercury. Further development and use of alternatives to amalgam restorations should be encouraged and the potential benefits of antidotes to toxic heavy metals, such as selenium and vitamin E dietary supplements should be clinically evaluated (Frost 1981, Kosta et al 1975, Magos and Webb 1980, Ganther 1980)."


Abstract: Mercury levels in blood and in mouth air before and after chewing were measured in 47 persons with and 14 persons without dental amalgam restorations. Questionnaires relating to exogenous sources of mercury exposure were administered to both groups. Differences in the mouth air mercury levels before and after chewing were statistically significant in the group with amalgams, but not in the group without amalgams. Analysis of the data from the questionnaires indicated that little or no exogenous exposure to mercury occurred among the two groups. Blood mercury concentrations were positively correlated with the number and surface area of amalgam restorations and were significantly lower in the group without dental amalgams."

Abstract: Neonatal uptake of mercury (Hg) from milk was examined in a pregnant sheep model, where radioactive mercury (Hg203)/silver tooth fillings (amalgam) were newly placed. A crossover experimental design was used in which lactating ewes nursed foster lambs. In a parallel study, the relationship between dental history and breast milk concentration of Hg was also examined in 33 lactating women. Results from the animal studies showed that, during pregnancy, a primary fetal site of amalgam Hg concentration is the liver, and, after delivery, the neonatal lamb kidney receives additional amalgam Hg from mother's milk. In lactating women with aged amalgam fillings, increased Hg excretion in breast milk and urine correlated with the number of fillings or Hg vapor concentration levels in mouth air. It was concluded that Hg originating from maternal amalgam tooth fillings transfers across the placenta to the fetus, across the mammary gland into milk ingested by the newborn, and ultimately into neonatal body tissues. Comparisons are made to the U. S. minimal risk level recently established for adult Hg exposure. These findings suggest that placement and removal of "silver" tooth fillings in pregnant and lactating humans will subject the fetus and neonate to unnecessary risk of Hg exposure.


Abstract: The fate of mercury (Hg) released from dental 'silver' amalgam tooth fillings into human mouth air is uncertain. A previous report about sheep revealed uptake routes and distribution of amalgam Hg among body tissues. The present investigation demonstrates the bodily distribution of amalgam Hg in a monkey whose dentition, diet, feeding regimen, and chewing pattern closely resemble those of humans. When amalgam fillings, which normally contain 50% Hg, are made with a tracer of radioactive 203Hg and then placed into monkey teeth, the isotope appears in high concentration in various organs and tissues within 4 wk. Whole-body images of the monkey revealed that the highest levels of Hg were located in the kidney, gastrointestinal tract, and jaw. The dental profession's advocacy of silver amalgam as a stable tooth restorative material is not supported by these findings.

**Abstract**: In humans Hg vapor is released from "silver" amalgam fillings that contain 50% Hg by weight. Previous studies show that when 12 such fillings are placed in sheep teeth, the kidneys will concentrate amalgam Hg at levels ranging from 5 to 10 micrograms Hg/g renal tissue 4-20 wk after placement. In the present study 12 occlusal fillings were placed in each of six adult female sheep under general anesthesia, using standard dental procedures. Glass ionomer occlusal fillings (12) were inserted in two control sheep. At several days before dental surgery, and at 30 and 60 days after placement of fillings, renal function was evaluated by plasma clearance of inulin and by plasma and urine electrolytes, urea, and proteins. An average plasma inulin clearance rate of 69.5 +/- 7.2 ml/min before amalgam placement was reduced to 32.3 +/- 8.1 ml/min by 30 days and remained low at 27.9 +/- 8.7 ml/min after 60 days. Inulin clearance did not change in controls. After amalgam placement urine concentration of albumin decreased from 93.0 +/- 20.5 to 30.1 +/- 15.3 mg/l and urine Na+ concentration increased steadily from 24.8 +/- 7.7 to 82.2 +/- 20.3 mmol/l at 60 days. Concentrations of K+, urea, gamma-glutamyl transpeptidase, alkaline phosphatase, and total protein did not change significantly from 0 to 60 days in urine. Plasma levels of Na+, K+, urea, and albumin remained unchanged from 0 to 60 days after amalgam. Renal histology remained normal in amalgam-treated animals." (ABSTRACT TRUNCATED AT 250 WORDS)

[Read the whole article here](#)

7. The US Dental Amalgam Debate: The 2010 Meeting of the FDA Dental Products Panel
Robert F. Cartland, Jr.

**Abstract**: An overview is presented of the current scientific debate being conducted in the US regarding health concerns associated with the mercury in dental amalgam. Much of the information reviewed was presented at a meeting held on December 14 and 15, 2010 by the Dental Products Panel of the Medical Devices Advisory Committee of the Food and Drug Administration. The scientific and historic context of the debate is provided, followed by scientific arguments, public testimony, panel deliberation and amalgam policy outside the US.

[Read the whole article here](#)
8. Mutter, J. Is Amalgam Safe For Humans?


**Abstract:**

It was claimed by the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) in a report to the EU-Commission that “….no risks of adverse systemic effects exist and the current use of dental amalgam does not pose a risk of systemic disease…”

SCENIHR disregarded the toxicology of mercury and did not include most important scientific studies in their review. But the scientific data show that:

(a) Dental amalgam is by far the main source of human total mercury body burden. This is proven by autopsy studies which found 2-12 times more mercury in body tissues of individuals with dental amalgam. Autopsy studies are the most valuable and most important studies for examining the amalgam-caused mercury body burden.

(b) These autopsy studies have shown consistently that many individuals with amalgam have toxic levels of mercury in their brains or kidneys.

(c) There is no correlation between mercury levels in blood or urine, and the levels in body tissues or the severity of clinical symptoms. SCENIHR only relied on levels in urine or blood.

(d) The half-life of mercury in the brain can last from several years to decades, thus mercury accumulates over time of amalgam exposure in body tissues to toxic levels. However, SCENIHR state that the half-life of mercury in the body is only “20-90 days”.

(e) Mercury vapor is about ten times more toxic than lead on human neurons and with synergistic toxicity to other metals.

(f) Most studies cited by SCENIHR which conclude that amalgam fillings are safe have severe methodical flaws.

[Read the whole article here](#)

9. Allergy to Mercury

While organized dentistry proclaims that allergy to mercury is “very rare,” the scientific literature has never supported that claim.
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180 subjects with amalgam fillings, 60 with no fillings;
patch test sensitivity to amalgam and its components, 16.1% positive with fillings,
0% positive without fillings.


Of 171 dental students patch tested, 32% were positive for mercury allergy. The percentage of positive tests correlated with the students’ own amalgam scores and with the length of time they had been in dental school.


Of 3000 subjects tested for 19 allergens, 5% were positive for ammoniated Hg, 8% positive for thimerosal.


Among 700 symptomatic, metal exposed patients, 14.1% tested positive for inorganic Hg allergy.

10. Mark C. Houston: **The role of mercury in cardiovascular disease.**
   *J Cardiovasc Dis Diagn* 2014, 2:5

**Summary**

1. Mercury has a high affinity for sulphydryl(-SH) groups, which inactivate numerous enzymatic reactions, amino acids and sulfur-containing antioxidants (NAC, ALA, GSH) with decreased oxidant defense and increased oxidative stress. Mercury binds to metallothionein and substitutes for zinc, copper and other trace metals reducing the effectiveness of metalloenzymes.


3. Selenium and fish high in omega 3 fatty acid content antagonize mercury toxicity.
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4. The overall vascular effects of mercury include increases in oxidative stress, immune dysfunction and inflammation, reduction in oxidative defense, vascular smooth muscle dysfunction, endothelial dysfunction, dyslipidemia, thrombosis, and mitochondrial dysfunction.

5. The clinical consequences of mercury toxicity include hypertension, CHD, MI, cardiac arrhythmias, LVH, diastolic dysfunction, sudden cardiac death, reduced HRV, increased carotid IMT and carotid artery obstruction, CVA, generalized atherosclerosis and renal dysfunction, renal failure, insufficiency and proteinuria. Pathological and biochemical findings correlate significantly with the clinical CV manifestations.

6. Mercury diminishes the protective effect of fish and omega 3 fatty acids.

7. Mercury inactivates COMT (catecholamine-0-methyl transferase), which increases serum and urinary epinephrine, norepinephrine and dopamine. This effect will increase blood pressure and may be a clinical clue to mercury toxicity.

8. Mercury toxicity should be evaluated in any patient with hypertension, CVD, CHD, CVA or other vascular disease that have a clinical history of exposure or clinical evidence on examination of mercury overload. Specific testing for acute and chronic toxicity and total body burden using hair, toenail, urine and serum should be done. The 24 hour urine measurements should be done with baseline and provoked samples.

Read the whole article here.