

## JAMA Papers Perpetuate the Myth

Our physician colleagues at the American Medical Association, sadly and surprisingly, allowed two flawed papers about mercury silver dental fillings to be published in its flagship journal, JAMA, on April 19, 2006<sup>1 2</sup>. Financed with \$11 million from the U.S. taxpayer supported NIDCR, the two studies purported to examine in a prospective fashion whether or not installing these mercury fillings in young children adversely affects their neurobehavioral, neuropsychological, and renal functioning. Concluding that no statistically significant differences existed between the children who had mercury fillings, and the children who did not, the two JAMA papers perpetuate the myth that amalgam is a safe and effective treatment for children<sup>3</sup>.

Dr. Herbert Needleman wrote in his editorial in the same issue of JAMA commenting about the two studies, *"It is predictable that some outside interests will expand the modest conclusions of these studies to assert that use of mercury amalgam in dentistry is risk free. This conclusion would be unfortunate and unscientific<sup>4</sup>."*

Even if the authors had reported that their studies proved that mercury fillings have serious medical consequences in children, their two papers should have been rejected by JAMA because no valid conclusions, pro or con amalgam, can be drawn from such poorly designed experiments and minimal data. Below in bold type is a list of the findings from previous studies that, unlike the two JAMA papers, were well designed and data-rich. After each of these findings are my comments in italics text about the deficiencies in the research reported in the two JAMA papers.

**In other studies, substantial amounts of elemental mercury vapor have been measured coming off mercury silver dental fillings in the mouths of amalgam bearers. These vapors contributed substantially to the daily dose that was detected in these individuals<sup>5 6 7 8</sup>.** *However, the authors of the two JAMA papers failed to report whether they had measured the amount of mercury released or estimate the daily dose from the fillings installed in the children's mouths.*

**Even though mercury comprises approximately 50% of each, the scientists conducting the two studies published by JAMA neglected to measure the amount of mercury actually installed in each child. Without these measurements, it is impossible to correlate the dose of mercury implanted with the urinary excretion or symptoms of neurological impairment.**

**The functioning of the immune system especially the B-cells and T-cells has been reported in other investigations to be depressed in people who have mercury fillings<sup>9 10</sup>.** *However, the two JAMA papers did not mention whether the clinical trials had examined mercury's impact on the children's T-cells.*

**Mercury sensitization can be measured in the B-cells<sup>11</sup>.** *However, mercury sensitization was not reported and apparently not measured in either of the two JAMA papers.*

**Although mercury vapor can induce autoimmunity in lab animals<sup>12</sup>,** *the authors apparently did not attempt to test the children for signs of autoimmunity.*

**People who have inherited the CPOX and APOe genotypes are unusually susceptible to the toxic effects of mercury.** *Considering the scientific and medical community's embrace of genomics medicine<sup>13 14</sup>, and the fact that James Woods was one of the authors, it's baffling that NIDCR did not require that the authors identify these*

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*vulnerable subsets of the population and correlate neurophysiological and neuropsychological results to the genotypes. Dr. Woods has published extensively about how abnormal porphyrin profiles can be used as an indicator of mercury intoxication and linked to accelerated neurological impairment.*

**Despite the fact that mercury is excreted primary through the biliary (liver) system into the feces, the authors did not report any measures of mercury in the children's feces.**

**In non-human primates as well as humans, mercury alters the gut flora so that they become antibiotic resistant. But, the JAMA papers did not report measurements of gut flora<sup>15 16</sup>.**

**In laboratory studies with sheep, mercury silver dental fillings have been shown to inhibit inulin clearance<sup>17</sup>. Inulin clearance tests not conducted in the clinical trials.**

**Mercury selectively accumulates in several organs, especially the kidneys. No measurements of body burden of mercury in any tissue were reported in the JAMA papers.**

**Since research has shown that a subset of the population does not effectively excrete mercury<sup>18</sup>, those children with the lowest urinary mercury would seem to have been the most likely to be injured because of their more rapidly increasing body burden from chronic exposure. It would have been instructive, therefore, if the authors had compared the children with the lowest urine mercury to those with the highest, to determine whether the treated and control groups of children differed in urinary mercury.**

**Mercury from dental fillings has been found to cause or accelerate bone loss in jawbones and cause or contribute to periodontal disease<sup>19</sup>. No examinations of jawbone mercury or periodontal integrity were reported in the JAMA papers.**

**An abnormal porphyrin can be detected in the urine of mercury-exposed people. Although the authors wrote that the children's urine was measured for porphyrin, they did not report the results in their JAMA papers but note that these findings will be published elsewhere at an unspecified later date.**

**Although mercury exposure and body burden is not related to urinary mercury, only a spot urinary mercury was reported.**

**Chronic low-level exposure to mercury over many years has been shown to impair nerve conduction in amalgam bearers as well as dental personnel<sup>20</sup>. But, oddly, the authors wrote that at the end of the seven years, the time period that the children were followed, the mercury exposure of the control group and the children with the mercury fillings did not differ.**

**Autopsies have found that the body burden of mercury is proportional to the number and surfaces of dental amalgam in the teeth at the time of death<sup>21</sup>. However, the authors did not correlate the neurophysiological test results to children's mercury burden or daily dose.**

**Even though mercury has been shown to inhibit the prosthetic molecule heme, tests that would measure or quantify any inhibition of heme synthesis were not mentioned in the JAMA papers<sup>22</sup>.**

**Affinity labeling has shown that mercury's inhibit tubulin, but the authors did not use this modern technology to evaluate tubulin .**

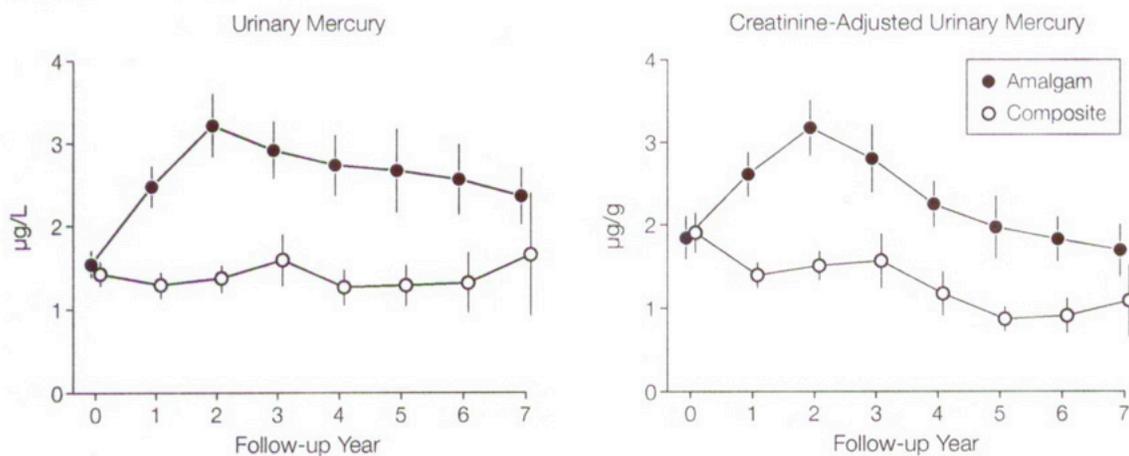
**As a result of fetal exposure to mercury from their mothers, an estimated 60,000 children in the U.S. may be at risk for developing learning disabilities. Mercury affects the developing fetus disproportionately<sup>23</sup>. But the authors did not examine the effects on maternal-fetal transfer of mercury from the mother's fillings to either the control or test children in this study.**

**Since chronic mercury toxicity results from prolonged low exposure to mercury for many decades, it is not surprising that the scientists concluded that mercury fillings were not toxic to the health of children who were followed for only seven years as an aggregated averaged whole?**

**Those investigators who have examined the mercury levels in urine have unanimously concluded that little correlation exists between urine mercury and exposure, body burden and any physiological or psychological effects<sup>24</sup>. The two studies did not address even one of the known short term effects and inaccurately relied upon urine mercury as the only measurement of exposure. Statistical significance is irrelevant if the investigators are comparing the wrong things.**

**Even though the authors of the two JAMA papers concluded that mercury fillings did not produce any adverse medical consequences, any dental or medical professional who carefully examines the minimal data of the two papers likely will be seriously concerned about the impact of mercury on the children in the studies' treated groups.** On page 1788 of the Casa Pia study in Portugal, a graph of urinary mercury is displayed in Table 2.

**Figure 2.** Mean Urinary and Creatinine-Adjusted Urinary Mercury Concentrations by Treatment Group and Follow-up Year



Error bars indicate 95% confidence intervals.

In the article authors reported that the children received 1.7 mercury silver dental fillings of permanent teeth initially and about 1 additional filling per year thereafter. Therefore, at the conclusion of this 7-year experiment, the average child in the studies would have approximately 8.7 fillings. Figure 2 above shows a clear tendency for urinary mercury to decline over time with a peak at about 2 years of exposure. This is particularly

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disconcerting because the authors reported increasing mercury silver dental filling burden during this same period.

Mercury has a well-known history of contributing to its own accumulation.

The kidney's ability to excrete mercury depends upon the blood level of small sulfur containing molecules such as cysteine. It is quite possible that the authors of the JAMA papers have demonstrated that chronically exposing young children to mercury can exhaust in just two years their bodies' ability to remove mercury from the blood circulation. In such a state, mercury exposure increases and excretion decreases, accelerating the rise in the body burden of mercury. Considering the violent and cumulative nature of mercury and its long history of poisoning humankind, the findings reported in the two JAMA papers are not at all reassuring. Clearly assurances from dental trade associations with a vested interest in the continued use of mercury-leaking fillings cannot and should not be relied upon in selecting dental filling materials that by today's standards are safe for our children and families.

**Full disclosure of all conflicts and potential conflicts of interest is norm in scientific circles today and remains the voluntary responsibility of scientists involved in research.** *The NIDCR reportedly, by contract, retained final editorial privileges over the publication of these studies. Also, at least one investigator was appointed during the study to a position with a trade association that has always advocated the safety of mercury in dental fillings.*

**In addition, other factors that might have added a confounding variable unrelated to the present study should be disclosed as well so that the other scientists reading the research can be fully aware of the circumstances in which the research was conducted.** *The Casa Pia orphanage is the site of a 30-year child molestation ring that was unearth during this study. One reading this paper would have no knowledge that these children were under other enormous psychological stresses that may or may not have skewed the relevant data.*

**All mercury dental fillings leak substantial amounts of mercury, therefore, it is the conclusion of the International Academy of Oral Medicine and Toxicology that implanting time-release mercury silver dental fillings in children or adults is neither safe nor necessary since numerous suitable alternatives already exist.** *These two studies add little to the knowledge base and due to their lack of adequate informed consent and prospective design are, in our opinion, a clear violation of the human research protection act. We have filed complaints with the respective university Institutional Review boards and are awaiting responses. For more detailed information and additional references see *A Scientific Argument Against the Use of Amalgam* at [www.IAOMT.org](http://www.IAOMT.org)*

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