

# Are Promoters of Dental Amalgam Poisoned by Mercury?

Jaro Pleva, Ph.D.<sup>1</sup>

## Abstract

*The insidious effects of mercury, used in dentistry, on mental performance of dental personnel might possibly be a partial explanation of impaired cognitive function and of inability to initiate corrective measures against the supplementation of a large part of the world population with uncontrollable doses of mercury from dental amalgam fillings. The mercury effects in dentists may lead to a neurotic syndrome comprising increase in aggressive mood, seclusion and reluctance to cooperate with other scientific disciplines.*

## Key Words

Dentistry, amalgam, mercury poisoning, mental effects.

## 1. Present Situation

The insidious systemic effects of mercury (Hg) and its compounds have been well known from both occupational and accidental exposures,<sup>1,2</sup> and, oddly, from medical use.<sup>3</sup> The hazards of mercury being released from dental amalgam (DA) fillings have been repeatedly under debate, but no consensus between pro- and anti-amalgamists has been reached. The history of the issue has been reviewed elsewhere.<sup>4</sup>

Typically, the pro-amalgam position is maintained by the users of DA, i.e. dentists and their professional and interest organizations. These produce most of the information forming the basis for the official position of the health authorities.

Dental amalgam is now considered as the main source of human exposure to mercury.<sup>5</sup> Moreover, the exposure of a typical dental patient often exceeds Threshold Limit Values (TLV) even by an order of magnitude.<sup>4</sup>

Nevertheless, the dentist organizations propose continued use of DA on the basis of 150 years of its anecdotal use. The safety of DA has not been

documented and the material is still used without any controlled epidemiological investigation of mercury toxicity and of immunologic effects in the particular individual. Dental fillings supplement a large world population with uncontrollable daily doses of mercury.

An environmental consideration discloses a strange situation: Whereas the discards of DA in dental practices, thermometers, batteries and other sources of mercury are now collected in many countries as dangerous waste, mercury is recovered from the waste to be deposited in the human mouth as the only "safe" depository. However, it becomes dangerous again after removal from the teeth.

At the same time, the dental "scientific" organizations, such as the International Association of Dental Research (IADR), propose continued use of mercury alloys as biomaterials of choice and postulate their own position to be based on science. In contrast to the declarations, dentistry has been reluctant to cooperate with medical and materials disciplines, and therefore was not able to deliver an explanation of the toxicological meaning of corrosion and abrasion rates, measured on DA (i.e. of the levels of mercury release).

In Sweden, mercury is going to be banned after 1997 from most of its uses, including DA, for environmental reasons. The Association of Swedish Dentists is the only organization, which protested against the ban, claiming amalgam to be indispensable.<sup>6</sup> The statements of the dental establishment indicate more interest in continued use of material, which is easy to apply, than in protecting the patient and determining scientific truth.

## 2. Effects of Mercury

Dentists are exposed to Hg both from occupational work and from their own DA-fillings. The average exposures to Hg-vapor from the two sources were estimated to be of comparable magnitude.<sup>7,8</sup> As indicated in some studies, dental personnel may be influenced by Hg more than the average population, and the present TLV's for

1. Lakheden 20, S-68392 Hagfors, Sweden.

occupational exposure to Hg-vapor should be lowered.<sup>9,10</sup>

Though there are documented effects of mercury in various chemical forms on the immune system,<sup>11,35</sup> endocrine glands,<sup>12</sup> kidneys,<sup>13</sup> sensory organs,<sup>14</sup> gut,<sup>415</sup> etc., the compartment particularly at risk is the nervous system.<sup>16-35</sup>

Mercury can reach the brain by crossing the blood - brain barrier,<sup>17</sup> and increased contents have been found in the pituitary,<sup>18</sup> occipital cortex, renal cortex and thyroid of dental staff cases.<sup>19</sup>

The manifestations of mercury effects on the nervous system are among others the known syndrome "erethismus mercurialis", comprising symptoms such as irritability, excitability, outbursts of temper and aggressivity, and quarreling.<sup>20</sup>

Recently, Ngim et al.<sup>9</sup> found a significant increase in aggressive mood in dentists exposed to mercury vapor below TLV, which suggests its effects on personality. Further he found worse performance in a battery of neurobehavioural tests of 98 dentists compared to 54 matched unexposed controls. The authors concluded, that fall in performance of memory and visuomotor capability could be signs of early damage to the central and peripheral nerves that may lead to presenile dementia, if Hg-exposure is continued.

Similarly, Bloch & Shapiro<sup>21</sup> described a high incidence of peripheral nerve dysfunction and visuo-perceptual distortion in dentists. Chronic subtoxic levels of inorganic mercury produced neuropsychological changes in dental workers in short-term nonverbal recall and heightened distress, and particularly in categories of obsessive compulsion, anxiety and psychoticism.<sup>22</sup>

Further known mental symptoms from Hg-exposure are loss of memory, dementia,<sup>23</sup> intellectual impairment (difficulty to receive, understand and treat information) and labile mood,<sup>24</sup> uncertain haste, inability to concentrate, difficulty in reading (dance of letters), neurasthenia,<sup>25</sup> disturbed consciousness, aphasy, incoherent thinking and speech.<sup>26</sup>

The syndrome may vary in intensity from a subclinical influence on the mood and intelligence, to severe anger, reminding one of the "mad as a hatter" syndrome, known from the felt-hat industrial exposures to inorganic mercuric salts.<sup>27</sup> The Mad Hatter is depicted in Lewis Carroll's "Alice's Adventures in

Wonderland", where the problems with incoherent thinking and speech are exemplified by his spouting one bit of gibberish after another: "Twinkle, twinkle, little bat! How I wonder what you're at!"

With respect to the effects of mercury, even below established TLVs, on mental performance, such as comprehension problems, inability to adapt to present knowledge and initiate corrective measures, mercury as a causative factor in the reluctant position of the dental profession must be taken into account.

Though synthesis of all extensive knowledge about DA and mercury<sup>28</sup> gives clear warning signals, the dental profession has not been capable of initiating such a synthesis. One omission is the continued looking for urinary mercury as a diagnostic measure of exposure, while kidney function becomes impaired by mercury and the main excretion occurs in the feces.

An epidemiologic evaluation of DA in etiology of health problems such as neurasthenia, neurologic mental defects and diseases, MS, ALS, immunologic and other modern disorders would not be too early.

Even if some of the dental decision makers leave their clinical activities for an administrative career, the influence of mercury, deposited in the central nervous system may persist for long time. Little is known about the pace of recovery from mental effects of mercury vapor after exposure has been stopped, but experience with DA-patients indicates, that the recovery from psychological symptoms is considerably slower than from somatic ones.<sup>29</sup>

It has been observed in some mercury affected DA-patients, that the comprehension problems obstruct their capability to understand the basic cause of their own health problems, even after they have been informed about simple facts (authors observation during 10 years of active participation in the amalgam debate).

The influence of mercury on coherence of thinking and ability to deal properly with incoming information may also have an impact on quality of published dental research.

Several publications serving as a basis for the statement of "safety" of dental amalgam are of such low quality, that comparable papers are very seldom accepted for publication

in the literature other than dental. Examples are:<sup>30-</sup>  
<sup>32</sup> a brief critique of some of them can be found  
in.<sup>4</sup> Here again, lack of interdisciplinary  
cooperation is apparent, resulting in negligence,  
omissions and errors, leading to wrong  
conclusions.

More seriously, official statements of dentists  
have been in direct conflict with the evidence  
from published data and clinical experience.

An example quoted from Sweden is the  
important report to The Swedish Social Welfare  
Board, stating, that "...a systematic deterioration  
of silver amalgam fillings has never been  
reported".<sup>33</sup>

Similar obfuscating statements have been made  
by the American Dental Association ADA,  
without commenting on the level of exposure or  
answering basic questions.<sup>34</sup>

### 3. Conclusion

Several behavioral features of the dental  
professionals might possibly be explained by the  
insidious mental effects from the pandemic use of  
mercury:

\* Impaired cognition of dental professionals  
could lead to problems in convincing them that  
there are health problems with mercury from DA-  
fillings.

\* The mercurial erethism with increase in  
aggressive mood seems to generate a neurotic  
syndrome, manifested by an insistence on their  
own opinion, even if proven in error.

\* The neurotic syndrome comprises striving  
for acknowledgement as expert not only in  
dentistry, but also in materials science and  
toxicological medicine, where he/she is ignorant.

\* The strange vindication of the antiquated  
mercury-based treatment in dental care, sup-  
ported by the dental organizations, resembles  
features of mercury poisoning in the Mad  
Hatter-syndrome.

It is therefore unavoidable that professionals  
outside the dental establishment must commit  
themselves to protection of the general population  
from the uncontrollable and indefensible exposure  
to mercury, which is used just for reason of easy  
applicability of the material.

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