

# Scientific Facts about Mercury and Dental Amalgam

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## **What really is that 'Silver' filling?**

Dental amalgam is an alloy of silver, tin, zinc and copper, which is combined with an equal amount of elemental mercury. The 'Silver Fillings' in your mouth are about 50% mercury.

As there is a continuous release of mercury from dental amalgam, dentists must dispose of scrap amalgam as toxic waste following strict guidelines. It is illegal to put it in the garbage, the sewer or the drain. In fact it seems that the only legal place to keep this material is in the mouth of a living person! (It is estimated that 11kg mercury per year is released from each crematorium chimney!)<sup>1,2,3</sup>

## **How Much Mercury is Too Much?**

Mercury escapes from amalgam in the forms of mercury vapour, elemental mercury and mercury ions. The rate of release of mercury is increased by an increase in temperature, friction and electrical currents. Elevated levels remain for about 90 minutes after such stimulation.<sup>4</sup>

The dental authorities claim that only a minute amount of mercury is released from amalgam fillings and although this is true, it is worth remembering that mercury is a cumulative poison. It stays in your body and the levels are topped up continuously. This type of poisoning is called micromercurialism. The earliest symptoms are usually sub-clinical and neurological, namely fatigue, headaches, forgetfulness, reduced short term memory, poor concentration, shyness and timidity, confusion, rapid mood swings, unprovoked anger, depression and suicidal tendencies.<sup>5,6,7</sup>

A variety of scientific studies<sup>8,9,10,11,12,13,14</sup> indicates that 20mcg/m<sup>3</sup> to 150mcg/m<sup>3</sup> of mercury vapour may be found in the mouth of a person with amalgam fillings. 1 mcg of mercury vapour is 5 times greater than the level quoted by the United States Environmental Protection Agency (USEPA) as safe.<sup>15</sup> It is 50 times greater than the level regarded as an acute exposure by the Agency for Toxic Substances and Disease Registry (ATSDR) in the USA.<sup>16</sup> The ATSDR lists mercury as one of the top 20 most hazardous substances known to man!

## **There is NO safe level of mercury vapour.**

World Health Organization stated in 1991 that for mercury vapour, there is no known "no-observable-effect level (NOEL)".<sup>17</sup> In other words all levels of mercury vapour are harmful. The WHO also demonstrated that dental amalgam is the single greatest source of mercury to the general population - up to 10 times more than from all other sources combined.

Latex paints, which contained mercury, had to be taken off the market after releasing only 2-3mcg/m<sup>3</sup>.

The Richardson Report, a study completed for Health Canada in 1995, found that the tolerable daily intake of mercury was exceeded in different age groups with the following number of amalgam fillings: adults - 4, teenagers - 3, children and toddlers - 1.<sup>18</sup>

Retention of mercury in the body is estimated to be 1mcg/filling/day.<sup>11, 12</sup> Up to 80% of inhaled mercury vapour is absorbed through the lungs.<sup>19,13</sup> A percentage of mercury vapour adheres to the lining of the nose and mouth and is transported directly into the brain.<sup>6</sup>

Mercury from amalgam easily crosses the blood brain barrier and can damage any part of the central nervous system.<sup>6</sup> Some mercury is also transported along nerve fibres (retrograde axonal transport) back to the brain.<sup>20,21,22,23,24</sup> Mercury from amalgam has been found all the way down the spinal cord.<sup>6</sup> The levels of mercury in the brain are directly proportional to the number of fillings in the mouth.<sup>8,10,12</sup> Minute amounts of mercury in the brain will cause the same type of damage as is found in the brains of patients with Alzheimer's Disease.<sup>25</sup> Low levels of mercury in the brain will severely disturb cellular function and reduce the growth of nerve fibres.<sup>6</sup>

Dentists regularly implant amalgam fillings directly into the bone in the form of retrograde root fillings (a filling placed at the end of the root). Mercury can pass readily from such an implant into the brain. Would any other branch of medicine condone such an absurd practice? One amalgam manufacturer, Caulk, states that amalgam is contraindicated for use as a retrograde filling, yet the Australian dental authorities teach and condone this practice!<sup>26</sup>

Mercury from amalgam may be found in all cells of the body (highest concentrations are usually in the kidney, liver and brain).

There will also be a very high concentration of mercury in the jaw bones and the soft tissue lining the mouth.

Blood and urine sampling are poor ways of estimating body burdens of mercury as most of the mercury is retained in the cells of the body (known as Retention Toxicity).

DMPS is a chelating agent, which will remove some mercury from cells and bind it in such a way that it can be excreted. Changes in urine mercury levels can then be measured.<sup>27,28</sup>

### **Mercury from amalgam does not cause a specific disease -**

it causes mercury poisoning which, is characterised by a wide range of symptoms.

Many organs and functions of the body may be affected.

The following are some basic facts from the published research:

- Mercury from amalgam fillings has been shown to cause a 50% reduction in kidney filtration after just two months in the mouth (animal studies)<sup>29</sup> Kidney damage from mercury has been reported often in the literature.<sup>30,31,32,33,34</sup>
- The most common symptoms of long-term low-level mercury poisoning are headaches and psycho-emotional disturbances. Muscle twitches and body shakes are later symptoms and thus more severe.
- Research from 1993 onwards has shown that mercury from amalgam fillings will cause an increase in the number of antibiotic resistant bacteria in the gut and mouth.<sup>35,36,37</sup> The number of antibiotic resistant bacteria fall rapidly after the amalgams are removed.
- Mercury from amalgams can cause a weakening in the wall of the small blood vessels (micro-angiopathies) – this results in a reduction of blood supply to the tissues resulting in reduced function and/or cell death.<sup>6</sup>
- Heart function may be affected by mercury and electrical currents from amalgam.<sup>38,39</sup>
- Some reports<sup>40,14</sup> suggest that elevated cholesterol levels are related to mercury in the body. It has been noted that cholesterol levels drop after removal of amalgam fillings.
- Although the dental associations claim that less than 1% of the population show true allergy to amalgam, the latest research<sup>41</sup> indicates that the real figure is closer to 13%. Assuming that only half the population in Australia has amalgam fillings, this would mean that over 1,700,000 people might be sick due to an allergic reaction to these fillings. Since the medical profession as a whole do not acknowledge the dangers of amalgam, it is most likely that the majority of these people are misdiagnosed and therefore mistreated.
- True allergy is only one type of immune reaction.<sup>42</sup>
- Mercury will always have a detrimental effect on the immune system. This creates an environment in the body for other diseases to develop.<sup>43,44,45,46,47,48,49,50</sup>
- Mercury binds to proteins, and thus makes them look like foreign material to the cells of the immune system.<sup>50,51</sup> Overt auto-immune diseases may then ensue.
- There are literally hundreds of peer reviewed scientific papers discussing the damaging effects that mercury has on the immune system.<sup>50</sup>
- Mercury from amalgam may cause an increase in allergies, skin rashes and itching.<sup>52,53</sup>
- Mercury will bind strongly to selenium, a trace element needed for a wide variety of enzyme functions. Latest research indicates a direct relationship between reduced

blood selenium levels and an increase in the rate of some types of cancer.<sup>54,55,56,57,58,59</sup>

- Many studies indicate that selenium supplementation will help to protect from the damaging effects of mercury.<sup>60,61,62,63</sup>
- Mercury binds to haemoglobin in the blood and reduces its capacity to transport oxygen.<sup>40</sup> This may be one of the causes of chronic fatigue.
- Mercury at levels as low as 1 part per ten million will destroy the walls of red blood cells.<sup>64,65,43</sup>
- In May 1998 the British Government recommended that dentists not place or remove amalgam in pregnant women.
- Mercury from amalgam fillings will cross the placenta and concentrate in the foetus.<sup>66,67,68,69,70,71,72,73,74,75,76</sup>
- Mercury from amalgam can also be transported via the breast milk and concentrate in the body of the feeding infant.
- Breast milk increases the bioavailability of mercury to the infant.<sup>77,78</sup>
- Prenatal exposure to mercury may cause developmental defects and may cause permanent neurological damage in the unborn child.<sup>69,70</sup>
- Tissue levels of mercury in the foetus, new-born and infant are directly proportional to the number of amalgam fillings in the mother's mouth.<sup>79</sup>
- Mercury is mutagenic - it can cause single strand breaks in DNA..<sup>80,81,82,83,84</sup>
- Female dental personnel exposed to mercury, exhibit twice the rate of miscarriage, infertility and still births as compared to the rest of the population.<sup>58,59,12,49</sup>

If you are pregnant, never allow amalgam fillings to be placed in your mouth.

Do not go into a dental surgery where amalgam is used, as the mercury vapour levels in the air may be harmful to the foetus.<sup>16</sup>

- Electric currents, generated by the interaction of different metals in the mouth, can be measured in micro-amps. The central nervous system operates in the range of nano-amps. This is about 1,000 times less than the currents generated in the mouth. This is in the same order of magnitude as that induced in a person standing under high-tension power cables.<sup>85,86,87</sup>
- Electrical currents, formed by placing gold into a mouth with amalgam fillings, will create an increase in electrical currents in the fillings, resulting in an increase in mercury released from all of the fillings.
- Placing a gold crown over an amalgam filling may cause a four-fold increase in the amount of mercury being driven through the tooth.<sup>62, 44</sup> Gold crowns, on top of amalgam, create a permanent galvanic cell. Amalgam is still the most commonly used material to build a core for a crown. This practice is contra-indicated by the manufacturers Caulk and Ivoclar.
- Dental fillings are an implant of materials into living tissues. Neither the United States Food and Drug Administration nor the Australian Therapeutic Goods Administration have approved mixed dental amalgam as an implant material.
- Although the dental authorities make claims about amalgam safety, they have not presented one scientific paper which indicates that this material is toxicologically safe.
- In dental surgeries where amalgam is used, the mercury vapour levels may be so high as to be hazardous to health. Dental associations have said that if mercury from amalgam is so dangerous for the patient, then why is it that the dentists, who are exposed to far greater levels of mercury, are not sick? This claim is not substantiated by the scientific literature.

In fact, dental personnel show a range of medical effects different from the rest of the population.

- Twice the rate of glioblastomas than the rest of the population.<sup>90</sup>
- Reduced IQ levels have been demonstrated<sup>91,92,93</sup>
- Psycho-motor and psycho-emotional studies of dentists, demonstrate a severe drop in scores compared to the rest of the population.<sup>94</sup>

- Twice the rate of suicide of any professional group.
- 20% of Canadian dentists are on permanent disability for psychological reasons<sup>9</sup>

### **Detoxification and Amalgam Removal**

Clinical experience has demonstrated that people affected by mercury from dental amalgams will often enhance the benefits of amalgam removal if removal is combined with a detoxification routine prior to, during and after the amalgam removal.

Removal of amalgam fillings has been shown to substantially lower the body burden of mercury.<sup>88,89</sup> Protocols do exist for the safer removal of dental amalgam from your mouth. Failure to follow these guidelines may result in exposure to an unacceptable level of mercury. Removing old amalgam fillings must be performed with extreme care.

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