

How the *tooth filling* placed in good faith by your family dentist can damage your health

By Dr Ilona Visser



Dr Ilona Visser obtained Bachelor degrees in science (microbiology and biochemistry) and dentistry, and has a post-graduate diploma in aesthetic dentistry, all from the University of Stellenbosch. She is in private practice

as a general dentist. For the past few years Dr Visser has concentrated her efforts on educating the public about dental health matters. She regularly writes articles for printed and electronic media, and frequently lectures at various meetings for specialised interest groups. Dr Visser is a member of the American Holistic Dental Association, the American Biologic Dental Association and the International Academy of Oral Medicine and Toxicology (IAOMT). She is the director of eduDENT (dental health education for the public) and Health Professionals for Information (education for practitioners), and lectures at national and international dental workshops and conferences. Dr Visser is currently forming the South African chapter of the IAOMT, and invites all health care practitioners to contact her (preferably via email at info@jouglimlag.co) or tel. 021-981 8824 should they be interested in joining this international academy (www.iaomt.com).

Amalgam literally means 'mixed with mercury', and it is the most common form of tooth restoration. The earliest record of the use of a 'silver paste' in teeth is in the materia medica of Su Kung from 659 AD. Alchemists were fascinated that mercury appeared to 'dissolve' powders of other metals such as silver, tin, and copper at room temperature.

Despite the pandemic use of amalgam as a tooth filling material, most dentists and doctors are still ignorant about the levels of mercury exposure and its health implications. It seems that a lack of interdisciplinary research and of a critical approach to established clinical routines appears to be the reasons for the failure of the dental profession to protect the patient from mercury exposure when saving a tooth.

The 'amalgam wars'

During the last millennium amalgam has been accused of initiating diseases three times. The first time was around the 1830s when the French non-dentist brothers Crowcour mixed French silver coin shavings and liquid mercury to form amalgam, and posing as dentists, they introduced their mixture to New Yorkers. It was well-known during the post-Napoleonic era that mercury was toxic, causing dementia and loss of motor control. The National Association of Dental Surgeons banned any dentist who used amalgam, and jokingly referred to these dentists as 'quacks' (derived from the English translation of the German word for mercury, 'quacksilber'). In 1859 this association was replaced by the American Dental Association (ADA) that leads the dental fraternity today. The ADA frowned upon dentists who preferred working with the less toxic but more expensive gold and refused to place amalgams. More than 40 dentists in the USA are currently delicensed by the ADA due to their stand against amalgam use. This is one of the reasons why dentists are not willing to oppose the use of amalgam openly.

In the 1920s and again in 1939 Dr Alfred Stock, a German chemist, warned against the use of mercury due to the dangers of mercury vapour. He himself became forgetful and ill after being exposed to mercury in the laboratory. Due to the abuse he suffered from organised dentistry after he published about 30 scientific articles on the matter in leading scholarly journals of the day, he withdrew from the 'war'.

The third movement started in 1973. Mass spectrophotometry and the Jerome mercury vapour detector were now able to detect the presence of trace amounts of mercury. In 1976, after vehemently denying that amalgams released mercury for years, the ADA had to acknowledge that it does, in fact, release mercury. They subsequently developed and patented a mixture with less mercury, but more copper, known as the non-gamma-2 amalgam, which is widely used today.

Show me the science

The pro-amalgamists support their opinion based on statements made by the ADA. Since the majority of dentists in North America rely on the guidelines of the ADA, their view carries heavy weight in the dental community. The ADA

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relies on the long use of amalgam as the strongest and most convincing reason for their support of the product. This is quite scary, as we are even now in the midst of a battle between pharmaceutical companies and the public regarding the use of drugs proven to be detrimental to health, and these are drugs that were even approved by the Food and Drug Administration (FDA) (amalgam is not FDA approved).

The following facts pertaining to the toxicity of dental amalgam have been proven:

- Amalgam releases significant amounts of mercury
- Amalgam is the largest source of mercury to the body
- Mercury is distributed to organs and tissues in the body
- Mercury crosses the placenta and is present in breastmilk
- Adverse physiological changes occur after mercury exposure
- Mercury interferes with cell metabolism.

Let's look at these facts in more detail.

Amalgam releases significant amounts of mercury

The ADA states that mercury is not toxic when used in dental amalgam, because when mercury is combined with other metals such as silver, tin, and copper, it reacts with them to form a biologically inactive substance. They have been proven wrong again.

A polished sample of amalgam was touched (not pressed) by a probe (such as the one dentists use) and a photomicrograph taken. The surface clearly showed droplets of free liquid mercury that were squeezed onto the surface of the amalgam. This was done without heating the amalgam. Actually, even when the amalgam was cooled down to the temperature of liquid nitrogen, mercury droplets still appeared. (You can view this image as well as many others mentioned in this article on the website of the International Academy of Oral Medicine and Toxicology¹.

As early as 1991, the World Health Organisation (WHO) declared that there is NO SAFE LEVEL of mercury exposure. So any exposure to mercury is toxic.

When a tooth containing a 25-year-old amalgam filling was placed in front of a screen illuminated by a pure mercury vapour discharge lamp, 'smoke' was seen emerging.¹ According to the principle of atomic absorption spectrophotometry, the only cold vapour that could absorb the wavelength of mercury emission light and cast a shadow is mercury itself.

According to the WHO, when one can visibly see the mercury vapour, it is already 1 000 times higher than the US Environmental Protection Agency (EPA) safely allows for the air that we breathe.²

Amalgam is the largest source of mercury to the body

In 1991 the WHO³ concluded that a person would absorb between 3 - 17 micrograms mercury/day, with 10 micrograms/day being the average, if one uses the average number of

amalgam surfaces that a person has. Other sources of mercury rendered far less absorption (from food 2.3 microgram, and from all other environmental sources 0.3 microgram).

For many years the ADA maintained that amalgams did not release mercury, despite the fact that several scientists were not just able to prove that mercury is released, but were even able to measure the amount of mercury vapour released by amalgams. During one of these studies, after the persons had been chewing gum for only 10 minutes, this vapour increased 8 - 10 fold, and remained elevated for at least 1.5 hours.^{4,5} An average absorbed mercury dose of 10 microgram mercury/day from amalgam fillings was found using measurements of mouth air.⁴

Canadian authorities appointed a Canadian scientist, Mark Richardson, to determine the tolerable daily intake of mercury (that is the amount of mercury that the body can be exposed to without health problems developing). This was after Health Canada was sued in the early 1990s by a group of consumer activists. Richardson found that many people, of all age groups, were actually exposed to 5 times more mercury than the tolerable daily intake which he had determined, and that a fifth of the population had central nervous system and/or kidney impairment as a result of amalgams, but without having any symptoms (therefore subclinical).⁶

Back in the USA, the Agency for Toxic Substances and Disease Registry (ATSDR) published the minimal risk level (MRL) for non-occupational exposure, which when related to amalgam fillings, would mean that even one amalgam would expose patients to more mercury than the ATSDR allowed.²

Mercury is distributed to organs and tissues in the body

Nearly 50 years ago a scientist, K O Frykholm, placed four amalgams containing radioactive mercury in eight volunteers' teeth (it is very doubtful if this experiment would be allowed today!).⁷

He concluded (incorrectly according to the basic principles of toxicology) that the release of mercury from the fillings was not a health problem. According to toxicological principles he should not have concentrated so much on what is excreted, but on what is absorbed and can therefore not be excreted. This is one of the main studies pro-amalgamists rely on when supporting amalgam use.

In order to demonstrate the absorption of mercury from amalgam fillings, amalgams containing radioactive mercury (²⁰³Hg) were placed in a sheep's teeth.⁸ Within 30 days the mercury was present in the walls of the digestive tract, kidneys, gums, jawbone (alveolar), and liver.¹ The teeth had been extracted prior to scanning. Dentists reacted to this study by claiming that sheep eat and chew differently from humans. The authors responded to this criticism by saying that the sheep represents the 'exacerbated case'. If the absorption of mercury from amalgam could not be found in such a chewing machine

as a sheep, the case would be closed the controversy over and amalgams could be placed with a clear conscience.

The study was repeated on monkeys that would eat much the same food and chew in much the same way as humans.⁹ It only confirmed the initial result.¹

Several studies have shown that when the number of amalgams increase, the following increase: amount of mercury absorbed, mercury level in the blood, amount of mercury excreted in the faeces, and amount of mercury contained in the body.¹⁰⁻¹³ When the amalgams were removed, all these levels dropped.¹⁴ When looking at studies done on the mercury content of urine and blood, it should be remembered that stat urine (a 'once-off' sample taken any time during the day) mercury content is only a reflection of the mercury amount that the kidney (as a target organ of mercury) cannot absorb, and that it lets through into the urine, since only 1% of mercury is detoxified via urine.

DMPS (2,3-dimercapto propane-1-sulfonic acid), a chelating agent that is used to remove toxic metals from the body, was given to a group of subjects with amalgam fillings, and a control group of subjects who had never had amalgams.¹⁵ This is called a challenge test. This level should be below 0.5 microgram mercury/gram creatinine excreted (the form in which the laboratory reports the mercury content of the urine sample). Urinary excretion of mercury in the non-amalgam group increased from 0.27 mcg to 5.1 mcg over a 9-hour period, while among the amalgam subjects it went from 0.7 mcg to 17.2 mcg. A highly significant correlation was found between the number of amalgam fillings and urinary excretion of mercury.

Autopsy studies^{16,17} show significantly higher mercury levels in brain and other body tissues in subjects with dental

amalgam, and mercury levels correlate significantly with the number and age of dental amalgams. In 1976 the ADA reiterated that amalgams do not cause any health problems to dental personnel. However, when dentists were examined after challenge tests, the results showed high urinary levels of mercury, and this correlated with neuropsychological and motor control deficits.¹⁸ Dental staff also showed altered porphyrin metabolism, as well as neurobehavioral changes, including impairment of attention, motor and perceptual skills, and increased irritability. It might be time that dentists who place and remove amalgams received danger pay!

Of all the patients that I have tested after a chelation challenge, I have thus far had only one patient with a normal level of mercury, and he did not have any amalgam fillings. In fact, in the majority of cases the results are more than 80 microgram mercury/gram creatinine (the normal level is less than 0.5), and even as high as 250 microgram mercury/gram creatinine, with patients suffering from various health problems.

Mercury crosses the placenta and is present in breast milk

Developing babies and young children are disproportionately affected by mercury exposure, because many aspects of development, particularly brain maturation, can be disturbed by the presence of mercury. Following placement of radioactive labelled mercury in amalgam in pregnant sheeps' teeth, it was found that both ewes and lambs showed mercury absorption within 2 days of placement of the fillings.¹⁹ The levels increased for about 30 days, and then remained constant right up until 140 days (after which the last measurement was taken and the experiment closed). This verified that the mercury found was >>



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not due to the initial placement procedure alone, but largely due to the continued release of mercury from the fillings. There was actually more mercury in the fetal blood than in the mother's blood. Even foster lambs (whose mothers did not have amalgams) that suckled from the ewes with amalgams now showed mercury in the body.

Autopsies from human stillbirths and early postnatal deaths showed that the more amalgam fillings the mother had, the more mercury was in the infant's brain, kidneys and liver. Human breastmilk mercury levels corresponded with the number of amalgams that the mother had.

Adverse physiological changes occur after mercury exposure

Inorganic mercury can cause acute damage to the gastro-intestinal tract when given orally, and if the animal survives, necrosis of the proximal tubule of the kidney occurs.

Immune system

In 1972 by using skin patch testing it was found that 5 - 8% of the population in the USA was allergic to mercury.²⁰ Any normal cell with even one molecule of mercury attached is seen as a foreign cell and activates the immune system to fight the 'invader', thus the start of auto-immune disease. Mercury increases immunoglobulin E (IgE) in blood and immune complexes in the kidneys and activates the induction of oligoclonal T-cell responses, therefore not restricting the immunomodulatory properties of mercury to pure contact allergy. By using specialised blood tests (a far more accurate method of determining allergies) it was found to be over 90%.²¹ This proved that the previous skin patch testing for mercury allergy was futile.

Mercury-containing amalgam may be an important risk factor for patients with auto-immune diseases. MELISA® testing can be used to monitor metal allergies. In a study conducted to determine if genetically susceptible individuals would have allergic reactions to mercury and elicit allergic and autoimmune reactions, it was found that an inflammatory process induced by metals may modulate the hypothalamic-pituitary-adrenal axis, and thus trigger multiple non-specific symptoms characterised by chronic fatigue syndrome and other chronic conditions such as myalgic encephalitis and multiple chemical sensitivity.²²

Renal system

Sheep studies showed an average of 54% decline in function of the kidneys (inulin clearance) after amalgams were placed.²³ Sodium in the urine increased (mercury concentrates in the proximal tubules in the kidney, where the sodium re-uptake takes place), and the albumin decreased. In humans the urinary albumin increased a year after amalgams were removed.²⁴ After a single dose of mercury the acute renal damage can be rapidly repaired, but repeated exposure to mercury causes fibrosis of the kidney.

Reproductive system

Dental nurses have been shown to have a fertility rate of only 63% compared with that of a control group.²⁵ Many other studies have shown the negative effect of mercury on the reproductive system.²⁶

Central nervous system

The brain is a critical target organ for mercury. There is substantial literature available on the neuro-teratological effects of mercury, where animals exposed to low doses of mercury

in utero and soon after birth show measurable deficits in intelligence, co-ordination, and other measures of neurological development. Vaccines preserved with thimerosal, a form of ethyl mercury, are also thought to cause neurological damage in infants, including autism.

Professor Boyd Hayley (protein biochemist, University of Kentucky) found that there were similar biochemical and cellular changes in Alzheimer patients and brain tissue exposed to mercury. Only one paper, published in a non-scientific non-referenced journal, could not find an association between Alzheimer's disease and mercury. This is in stark contrast to many studies published by Professor Hayley and various other scientists in peer-reviewed scientific journals.^{27,28} A genetic susceptibility for mercury toxicity and neurological damage was also found.

One of the few laboratories in the world that has the capacity to maintain growing neurons (nerve cells) in tissue culture is at the University of Calgary Medical School. Recently, a group there published a paper and an accompanying video²⁹ that shows how very low concentrations of mercury chloride causes the tubulin in the growth cones of young neurites to fall apart.

Table 2 A summary of the subjective reports of 1 569 patients who participated in six different surveys of health effects improving after replacement of amalgam fillings. Only the top 85% are reported here.

Symptom reported	Percentage of patients claiming substantial relief
Allergy	89%
Anxiety	93
Bad temper	89
Bloating	88
Chest pains	87
Depression	91
Dizziness	88
Fatigue	86
Gum problems	94
Headaches	87
Migraine	87
Irregular heartbeat	87
Irritability	90
Lack of energy	97
Metallic taste	95
Sore throat	86
Oral ulcers	86

In the case of mercury, essential metabolic systems such as reduced glutathione, metallothionines, and apolipoprotein-E double as protective elements. However there are genetic variations and polymorphisms to these elements that inevitably leave some individuals more vulnerable to assault. This explains why some people with amalgams will not have any clinical effect, while others do.

The Internet and lay publications (not scientific peer-

When looking at the toxicity of mercury it is important to distinguish between exposure, to absorption and retained levels. One does not necessarily absorb all the mercury to which one is exposed. It is the retained dose that is the critical dose, as this the dose that will cause harm.

reviewed journals) are full of anecdotes from people who claim that their health improved once their amalgam fillings were replaced with other materials. Although their stories do not constitute scientific cause and effect evidence, these are real people with real-life experiences. In order to prove this, the amalgams would have had to be replaced, and notes made if the symptoms recurred. Not many people, whose lives were affected by amalgams, would be prepared to go through that ordeal again!

Oral and intestinal flora

An association was found between mercury-resistant bacteria in the intestines and bacteria with multiple antibiotic resistance. The increase in mercury-resistant bacteria was maintained in monkey studies until the amalgam fillings were removed from the monkeys' teeth.³⁰

Mercury interferes with cell metabolism

Various interferences with DNA, glutathione, monocytes, iron and selenium metabolism have been recorded. Neutrophils and leucocytes are affected. Oxidant/antioxidant ratio is disturbed. Mitochondrias' inner membranes are disrupted, and the calcium homeostasis is altered due to the stimulation of the mitochondria to release calcium.

Disorders linked to chemical and metal toxicity³¹

The following is a list of the most common disorders found by research studies to be directly linked to toxic metals and chemicals: attention deficit disorder, Alzheimer's disease, asthma, arthritis, autism and autistic spectrum disorders, auto-immune disorders, candidiasis, chronic fatigue syndrome, cancer, epilepsy, fibromyalgia, heart diseases, hypertension, chronic insomnia, infertility, kidney disease, liver disease, Lou Gehrig's disease (ALS), multiple sclerosis, Parkinson's disease, schizophrenia, thyroid and adrenal disorders.

What is happening in other countries?

The largest experiment in the world on mercury release from amalgam fillings into the saliva, known as the Tübingen amalgam tests, was conducted in 1995 on 20 000 people.²⁸ The results clearly showed an increased mercury load in relation to the number of amalgam fillings present. This prompted BUND to advocate a ban on dental amalgam. Since then various Scandinavian countries such as Sweden and Denmark placed restrictions on the use of dental amalgam, and if amalgam is found on the premises of Swiss dentists, these dentists can be criminally charged.

As of late, Sweden has completely banned the use of amalgam (it is treated the same as uranium), and Germany, Denmark, Norway, do not allow amalgams to be placed in pregnant women and children under 3 years. Germany has stopped the production of dental amalgam all together. In the USA Californian dentists are not allowed to place amalgams, and in Maine a dentist is required by law to warn a patient of the dangers of amalgam before placing amalgam fillings. The ADA has also, in its revised patient advice booklet, suggested that amalgams should not be used in children, pregnant women and women of childbearing age.

So it seems as if mindsets are changing, albeit very, very slowly. Might it be that the ADA is bringing up a generation that will be amalgam-free? This would solve the problem of class action lawsuits, since no-one would then be alive any more who still had amalgams to file these lawsuits, and the ADA could finally agree that amalgams are detrimental to health. >>

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