

# Dental Amalgam Scientific Facts

Editor :

Bernard Windham,

(Organization: Florida Public Service Commission )

RR2, Box 385A

Tallahassee, FL 32322

904-878-9024

E-mail DJRZ14A@prodigy.com

## **I. Some Facts.**

### **1. Dental amalgam contains about 50 % mercury.**

The average filling has 1/2 gram of mercury.

### **2. Mercury is the most toxic of the toxic metals. Mercury is:**

(a) **cytotoxic** (kills cells) (2,27,33) [106,147,148,150,160].

(b) **neurotoxic** (accumulates in the brain and damages brain cells) (27,34,48) [85,111,147,148,160,162]

(c) **immunotoxic** (damages and weakens the immune system) (27,34,35,42,43,44,45,46,47,48,60) [77,78,105,117,127,128,146,155,160,226]

(d) **nephrotoxic** (toxic to kidneys) (59), [157,203,211,223]

(e) **endocrine system-disrupting chemical** (affects pituitary gland) [85,105,113,146,149]

(f) **reproductive and developmental toxin** (2,3,4,20,22,24,31,37,38,39,49,41,49) [105,146,149,160,204].

(g) **causes cardiovascular damage and disease** including damage to vascular endothelial cells, increased white cell count, and decreased oxyhemoglobin level (47,201,202,205,232).

(h) **causes immune system damage** resulting in allergies, asthma, and multiple sensitivities (228,230)

3. Mercury crosses the blood brain barrier and is selectively stored in the pituitary gland of the brain. [48,85,113,146,162] The pituitary gland controls the body's endocrine system and secretes hormones that control most bodily processes, including the immune system and reproductive systems [146].

4. Mercury's biochemical damage at the cellular level include DNA damage, alteration of protein structure, alteration of the transport of calcium, induction of free radical formation, inhibition of glutathione peroxidase enzyme, endothelial cell damage, and immune system damage. Only a few micrograms of mercury severely disturb cellular function and inhibit nerve growth (181). 98% of mercury found in the brain is in the methyl mercury form, the most toxic form (220). Most mercury in saliva was also

organic.

5. Hormonal secretions of the pituitary gland that control bodily processes are at extremely low levels and extremely low levels of mercury are required to adversely affect hormonal secretions of the pituitary gland. Hormonal secretions affected at levels much lower than acute toxicity effects normally tested for. [105,146]

6. Because of the extreme toxicity of mercury, only 1/2 gram is required to contaminate a 10 acre lake to the extent that a health warning would be issued by the government to not eat the fish [151,160]. Over half the rivers and lakes in Florida have such health warnings [160].

7. Some Florida panthers that eat birds and animals that eat fish containing very low levels of mercury (about 1 part per million) have died from chronic mercury poisoning [160]. Since mercury is an estrogenic chemical and reproductive toxin, the majority of the rest cannot reproduce. The average male Florida panther has higher estrogen levels than females, due to the estrogenic properties of mercury [105,160]. Similar is true of some other animals at the top of the food chain like alligators.

8. In addition to having estrogenic effects, mercury has other documented hormonal effects including effects on the reproductive system resulting in lowered sperm counts, defective sperm cells, and lowered testosterone levels in males and lowered levels of brain neurotransmitters dopamine, serotonin, and norepinephrine [105,107,140,141].

9. An average amalgam filling contains 1/2 gram of mercury, and the average adult had at least 5 grams of mercury in fillings (unless most has vaporized). Mercury in solid form is not stable and vaporizes continuously, so that within 10 years more than half has been transferred to the brain and body of the host (34,47) [182].

10. The level of mercury in people with amalgam fillings causes a body burden of mercury much higher than they could get from eating contaminated fish from Florida waters with government health warnings. (WHO, 183)

11. Running shoes with 1/2 gram of mercury in the heels were banned by several states, because the amount of mercury was considered dangerous to public health and created a serious disposal problem. Mercury from dental offices and human waste from people with amalgam fillings has much higher levels and is a major source of mercury in Florida waters. One study found dental offices discharge into waste water between 65 and 842 milligrams per dentist per day (231), amounting to several hundred grams per year per office. This is in addition to air emissions.

\* More detailed descriptions and references are contained in [105,160]. References in parentheses were compiled by the Australasian Society of Oral Medicine and Toxicology. References in brackets were compiled by Bernard Windham.

## II. Systemic Mercury Intake Level from Amalgam Fillings

1. Mercury in solid form is not stable and evaporates continuously from amalgam fillings in the mouth, being transferred over a period of time to the host (211). Mercury vapor from amalgam is the single largest source of systemic mercury intake for persons with amalgam fillings. (16,17,19,57,) [78-82,94,111,126,129,130,138,161,183,211,216]. Amalgam also releases significant amounts of tin and copper which also have toxic effects, with organic tin formed in the body being much more neurotoxic than mercury [185,222].

2. Mercury vapor is absorbed at a rate of 80% through the lungs into the arterial blood and is also absorbed by oral mucosa. (18,31,40) [77,79,84,94,96,117,133,211,222]

3. On average for a person having amalgam fillings, vapor from amalgam fillings amounts to about 80% of total systemic intake. [78-82,93,94,179,211]

4. Having dissimilar metals in the teeth (e.g.-gold and mercury) causes electrical currents and much higher mercury vapor levels and levels in tissues. (19,27,30) Average mercury levels in gum tissue near amalgam fillings are 250 ppm, but are often 1200 ppm near a gold cap on an amalgam filling (30,25,47)[186,194]. Concentrations of mercury in oral mucosa for a population of patients with 6 or more amalgam fillings taken during oral surgery were 20 times the level of controls [174]. The level of mercury and copper released from high copper amalgam is as much as 50 times that of low copper amalgams [191]. High levels of mercury vaporize and are picked up by the body and bloodstream during dental work (high-speed grinding) on amalgam fillings, which results in much higher levels in the heart, brain, liver, and kidneys (219,205,etc.).

5. The average level of mercury in the urine of a person with amalgam fillings (1.9 parts per million) is approximately twice that of the FDA and EPA Action Level for bans on eating fish and food due to high mercury level (1 ppm) and can be as much as 50 times the EPA Critical Level. [134, 154, etc., 160]

The US Agency for toxic Substances and Disease Registry standard (MRL) for acute inhalation exposure to mercury vapor is 0.02 mcg Hg/m<sup>3</sup> and the MRL for chronic inhalation exposure is 0.014 mcg Hg/m<sup>3</sup>. Common levels found in persons with amalgam fillings are over 100 times these MRLs (217,209). Thus persons with amalgam fillings have levels of intraoral mercury vapor higher than the level considered to have significant health risk.

6. There is only a weak correlation between blood or hair mercury levels and body burden or level in a target organ [157]. Feces has a significant mercury burden in people with amalgam fillings, having a higher correlation to systemic body burden than urine or blood, which tend to correlate with recent exposure level. (47) [79,80] As damage occurs to kidneys over time, mercury is less efficiently eliminated [157].

7. Mercury accumulates in the brain, liver, kidneys, heart, and oral mucosa (1,20,31,34) [77,79,84,85,94 ,111,149,205,211,219]

8. The number of amalgam surfaces has a statistically significant correlation to :

- (a) blood plasma mercury level (17) [84,133,211]
- (b) urine mercury level (16) [76,77,138]
- (c) oral mucosa and saliva (18)[77,79,94,117,199,211,222]
- (d) feces mercury [79,94,117]
- (e) pituitary gland (14,16,19,25) [85,113]
- (f) brain occipital cortex (14,16,19,25,34) [85,111,149,211]

9. A person with amalgam fillings has daily systemic intake from mercury vapor of between 3 and 70 micrograms of mercury, with the average being at least 12 micrograms per day. [77,83,85,179,211]. Total intake is proportional to the number and extent of amalgam surfaces, but other factors such as chewing gum and drinking hot liquids influence the intake significantly. (18,28,31,56) [135-139,193,211]. Vapor emissions range up to 200 mcg/M3 (47)[193] and are much higher after chewing. Approx. 39% of those having amalgam fillings tested in a large German study had ingested mercury levels exceeding the WHO mercury standard (199).

10. The blood and kidney mercury load of a person with amalgam fillings is often 5 times that of a similar person without. (16)[79,80,82,84,93,111,136,138 The average blood level for one large population was 24.8 nmol/l [176]. Normal blood levels are less than 20 ppb, but health effects have been observed in patients in the upper part of this range [196]. A Swedish study estimated the total amount mercury swallowed per day from intra-oral vapor was 10 micrograms per day [177]. Other studies have found similar amounts (211).

11. Teeth are living tissue and have massive communication with the rest of the body via blood, lymph, and nerves. Mercury vapor (and bacteria in teeth ) have paths to the rest of the body. (34, etc.) One German study of mercury loss from vapor in unstimulated saliva found the saliva of those with amalgams had 5 times as much mercury as for controls [179].

12. Mercury crosses the blood brain barrier and is stored preferentially in the pituitary gland, hypothalamus, and occipital cortex in direct proportion to the number and extent of amalgam surfaces. (1,13,19,20,25,34,55a) [85,111,113,149] Thus mercury has a greater effect on the functions of these brain areas.

13. Some mercury entering nasal passages is absorbed directly into the olfactory lobe and brain without coming from blood. (34,47,55a).

14. Mercury is transported along the axons of nerve fibers (33,34,47,50).

15. Mercury from amalgam is transported freely via the blood after entering the blood through the lungs (19,34,35).

16. Mercury has a long half life in the body and brain, and chronic low level intake results in a slow accumulation in body tissues. (20,26,34,47) [etc.]

17. Methyl mercury is more toxic to some body processes than elemental mercury. Mercury from amalgam is methylated by bacteria and candida albicans in the mouth and intestines (51,53,54) [81,185,225]. Methyl mercury is 1000 times more potent in causing genetic damage than any other known chemical (Ramel, in(47)).

18. The level of mercury in the brain tissue of the fetus, new born, and young children is directly proportional to the number of amalgam surfaces in the mother's mouth. (61, etc.) [112,113,114,204]

19. Mercury from amalgam in pregnant women crosses the placenta and appears in amniotic fluid and fetal blood, liver, and pituitary gland within 2 days of placement (18,31) [113,162,204]. Mercury is often stored in breast milk and the fetus at much higher levels than that in the mother's tissues (18,19,22,23,40,41,61) [112,114,204]. The highest level is in the pituitary gland of the fetus which affects development of the endocrine, immune, and reproductive systems.

20. There is a significant correlation between the number of amalgam fillings of the mother and the level of the fetus and older infants [112,113,114,204], and also with the level in mothers milk (18,19,61) [112,113]. Fertile women should not be exposed to vapor levels above 10 mcg/M3 (38,61)[195].

### **III. Medical Studies Finding Health Problems Related to Amalgam Fillings**

1. Toxic/allergic reactions often result in lichen planus lesions in oral mucosa or gums and play a roll in pathogenesis of periodontal disease. Removal of amalgam fillings usually results in cure of such lesions. [82,86,87,90,94,101,133,145,192]

2. Numerous studies have found long term chronic low doses of mercury cause neurological, memory, behavior, and mood problems (34) [71,74,107,108,109, 115, 119,140,141,196,222]. Organic tin compounds formed from amalgam are even more neurotoxic than mercury (222).

3. Studies of groups of patients with amalgam fillings found significantly more neurological, memory, mood, and behavioral problems than the control groups. (34) [107,108,109,140,141,196,222]

4. Mercury binds to hemoglobin in the red blood cells thus reducing oxygen carrying capacity (1,16,17,21,26,35,47), and at 1 ppm can destroy the membrane of redblood cells (35,47,22,17) and damage blood vessels- reducing blood supply to the tissues (34). These effects often result in fatigue and reduced energy levels [115,119,140,141,202,212,235]. Mercury also accumulates in the heart and damages myocardial and heart valves (Turpayev, in 47)& 205).

5. Mercury amalgam exposure adversely affects the immune system (27,34,48) [77,78,118,199,226]. One of several effects is to increase the average blood white cell count by 2000 to 10000 (47). The increased white count usually normalizes after amalgam removal. Mercury also blocks the immune function of magnesium and zinc [197].

6. Mercury from amalgam interferes with production of cytokines, disabling early control of viruses and leading to enhanced infection [131].

7. A group of patients with amalgam fillings and complaints of systematic symptoms including central nervous system problems and a group of controls were given MRI tests. 81% of the group with health complaints had pathological MRI results including signs of degeneration of the basal ganglia of the brain, but none in the controls. 60% of the symptom group tested positive for immune system reaction to mercury. The authors concluded that immune reactions have an important role in development of brain lesions ,and amalgam fillings induce immune reactions in many patients [118].

8. Among a group of patients testing positive as allergic to mercury, low level mercury exposure was found to cause adverse immune system response, including reduction of in vitro production of tumor necrosis factor TNF alpha and interleukin-1. [152]

9. Patch tests for hypersensitivity to mercury have found from 2% to 42% to test positive [87,154,178]. In a study of medical students, 12.8% tested positive as allergic to mercury, and those testing positive had significantly higher average number of amalgam fillings than those not testing positive (and higher levels of mercury in urine [132]. Other studies have found increasing allergy to mercury related to amount of exposure and time period of exposure [156, etc.]. If this is a good estimate of the percent of Americans allergic to mercury, this would be about 30 million people especially vulnerable to increased immune system reactions to amalgam fillings. However, patch tests do not measure the total population getting toxic reactions from mercury. The most sensitive reactions are immune reactions, DNA mutations, and systemic effects (47).

10. Low level mercury exposure including exposure to amalgam fillings has been found to be associated with increased auto immune diseases , including lupus, Crohns disease, lichen planus, endometriosis (1, 14, 17, 19, 21, 25,27,34,35,42,43,44,45,47,49,55,60) [77,78,215,226]. Silver, like mercury, is released from amalgam fillings and stored in the body and has been shown to cause immune reactions and autoimmunity in animal studies [77, 78, 129,226]

11. People with amalgam fillings have an increased number of intestinal microorganisms resistant to mercury and many standard antibiotics. (47,58)[116,117] Studies have found a significant correlation between mercury resistance and multiple antibiotic resistance [116,117,161].

12. Mercury from amalgam binds to the -SH (sulphydryl) groups, resulting in inactivation of sulfur and blocking of enzyme function, producing toxicity. Sulfur is essential in enzymes, hormones, nerve tissue, and red blood cells. These exist in almost every

enzymatic process in the body. Mercury also blocks the metabolic action of manganese and the entry of calcium ions into cytoplasm. Mercury from amalgam thus has the potential to disturb all metabolic processes (25,33,47,60)[180,197]. Mercury is transported throughout the body in blood and can affect cells in the body and organs in different ways.

13. Several studies found adverse health effects at mercury vapor levels of 1 to 5 mcg/M3 (47).

14. Mercury accumulates in the kidneys with increasing levels over time. Mercury exposure has been shown to adversely affect kidney function in occupational and animal studies (59,203,211, etc.). The Government's toxic level for mercury in urine is 30 mcg/L [189], but low levels in urine often mean high mercury retention and chronic toxicity problems.

15. Amalgam fillings produce electrical currents which increase mercury vapor release and may have other harmful effects (19,27,28,29,35,47,56)[194]. These currents are measured in micro amps. The central nervous system operates on signals in the range of nano-amps, which is 1000 times less than a micro amp (28). Negatively charged fillings or crown appear to cause higher mercury vapor losses (47).

16. Mercury from amalgam fillings is transferred to the fetus of pregnant women and children who breast feed at levels often higher than those of the mother (18,19,31,61) [112,113,114,195,204]. Mercury has an effect on the fetal nervous system at levels far below that considered toxic in adults, and background levels of mercury in mothers correlate significantly with incidence of birth defects and still births [204,38].

17. Since mercury is documented from studies of humans and animals to be a reproductive and developmental toxin [105,146,224], mercury can reduce reproductive function and cause birth defects and developmental problems in children. (2,3,4,20,24,31,37,38,39,40,41,49)[224]. Clinical evidence indicates that amalgam fillings leads to hormone imbalances that can reduce fertility (199,38). Some researcher's advise pregnant women should not be exposed to mercury vapor levels above 10 mcg/M3 (61)[195] and several governments have bans or restrictions on use of amalgam by women of childbearing age.

18. Mercury causes breaks in DNA (41,42,)[197]. Low non-cytotoxic levels of mercury induce dose dependent binding of mercury to DNA and significantly increased cell mutations [142] and birth defects [197,38].

19. Mercury by its effect of weakening the immune system contributes to increased chronic diseases and cancer [222,234, etc.]. Amalgam fillings have also been found to be positively associated with mouth cancer (206).

20. In addition to the endocrine system disrupting effects of high mercury accumulation in the pituitary gland, mercury causes a reduction in thyroid production and an accumulation in the thyroid of radiation. Mercury's adverse influence on thyrocytes can

play a major role in thyroid cancer etiology [144]. Mercury has been found to affect hormone production at very low concentrations (199).

21. Allergies and hair-loss were found to be 2-3 times as high in a group with large number of amalgam fillings compared to controls (199). Higher levels of hormone disturbances, immune disturbances, recurrent fungal infections were also found in the amalgam group.

22. There has been no evidence found that there is any safe level of mercury in the body that does not kill cells and harm body processes (WHO,183, etc.). Mercury levels of 10ppm severely disturb cellular function, and growth of nerve fibers are affected at much lower levels [181]. This is especially so for the pituitary gland of the developing fetus which is the most sensitive to mercury (2-4,19-24,30,31,36,37,39-44).

23. The level of mercury released by amalgam fillings is often more than the levels documented in medical studies to produce adverse effects (see previous text).

#### **IV. Health Effects from Dental Personnel Exposure to Mercury Vapor.**

1. Dentists and dental personnel who work with amalgam are chronically exposed to mercury vapor. (1,6-12,32,34,36) [72,122,123,124,171,172,173] Studies note that carpeting in dental offices should be avoided as it is a major repository of mercury [188]. Mercury levels in urine of dental personnel average about 2 times that of controls (123,124,171) and was 43 nmol/liter for a population surveyed in Sweden(171), which is above the Swedish occupational exposure guideline.

2. Drilling old amalgam fillings with only a saliva extractor and no other precautions produces mercury vapor levels 2 to 15 times occupational threshold limit values (30 micrograms/cubic meter)[120,219].

3. The average dental office exposure affects the body mercury level approximately the same as having 19 amalgam fillings [123,124,173].

4. Body burden increases with time and older dentists have median mercury urine levels about 4 times those of controls, as well as higher brain and body burdens (13,34) [70-74,122]. Some older dentists have mercury levels in some parts of the brain as much as 80 times higher than normal levels (14,34).

5. Dentists and dental personnel experience significantly higher levels of neurological, memory, mood, and behavioral problems, which increase with years of exposure (13,34,49) [69-74,88,122,188].

6. Female dental technicians who work with amalgam have significantly reduced fertility and lowered probability of conception (3,24,38)[121], and their children have significantly lower average IQ compared to the general population (13). The level of mercury excreted in urine is significantly higher for female dental assistants than

dentists (171,172,173).

7. Many homes of dentists have been found to have high levels of mercury contamination (introduced) by dentists bringing it home on shoes and clothes [187].

8. Some studies have found increased risk of lung, kidney, brain, and CNS system cancers among dental workers (14,34)[143].

9. Autopsies of former dental staff found levels of mercury in the pituitary gland averaged over 10 times that of controls (99), as well as higher levels in the occipital cortex and renal cortex and thyroid.

## **V. Results of Removal of Amalgam Fillings.**

1. For the week following amalgam removal, body mercury levels increase approx. 30 % (unless Chelation is also used), but within 2 weeks levels fall significantly. [82,89]

2. Removal of amalgam fillings resulted in a significant reduction in body burden and body waste product load of mercury [75,82,88,89,93,95,96,125,200].

3. Total reduction in mercury levels in blood and urine is often over 80% within a few months [82,89,93,96,200].

4. There are extensive documented cases (many thousands) where removal of amalgam fillings led to cure of serious health problems such as periodontal diseases, immune system problems, allergies, asthma, multiple sensitivities, epilepsy, blood conditions, stomach pain, depression, mental confusion, infertility, lupus, MS, chronic fatigue syndrome(CFS), arthritis, tachycardia, universal reactors, etc. or significant improvement in symptoms.

[75, 86-91, 94-103,125,148,165,167,168,170,180,182,192,199,200,222,229,233,234,235,237]

Interviews of a large population of Swedish patients that had amalgams removed due to health problems found that virtually all reported significant health improvements and that the health improvements were permanent (233). (study period 17 years) A compilation of an even larger population found similar results (237). For example 89% of those reporting allergies had significant improvements or total elimination; extrapolated to US population this would represent over 17 million people who would benefit regarding allergies alone.

5. Some studies of patients with major neurological or degenerative diseases such as Alzheimers, ALS, MS, Parkinson's, etc. have found evidence amalgam fillings may play a major role in development of that condition.

(66,67,92,97,98,100,102,145,148,158,159,163,166,169,170,175,183,184,207,213,218,21,228

Very high levels of mercury are found in brain memory areas such as the cerebral cortex and hippocampus of patients with diseases with memory related symptoms [158]. Studies have found mercury related mental effects to be indistinguishable from those of MS (207). Mercury at extremely low levels interferes with formation of tubulin producing neurofibrillary tangles in the brain similar to those observed in Alzheimer's patients with high levels of mercury in the brain (207). Also mercury binds with cell membranes interfering with sodium and potassium enzyme functions, causing excess membrane permeability, especially in terms of the blood-brain barrier [159,207]. Less than 1 ppm mercury in the blood stream can impair the blood-brain barrier. Mercury was also found to accumulate in the mitochondria and interfere with their vital functions, and to inhibit cytochrome C enzymes which affect energy supply to the brain. Persons with extra Apo-E4 gene copies are especially susceptible to this damage (207,221). In many cases (many thousand documented) removal of amalgam fillings and treatment for metal toxicity led to 'cure' or significant improvement in health [97,100,102,148,170,207, 213,222,234,237]. There is some evidence that some forms of leukemia are abnormal response to antigenic stimulation by mercury or other such toxins and removal of amalgam has led to remission in some cases (47)[180].

6. Mercury exposure through fillings appears to be a major factor in chronic fatigue syndrome (CFS) through its promotion of growth of candida albicans in the body and the methylation of inorganic mercury by candida to the extremely toxic methyl mercury form which crosses the blood brain barrier and also damages and weakens the immune system [225,226,234,235,237, etc.]. Methyl mercury has also been shown in animal studies to induce autoimmune reactions and disease through its affects on immune system T cells (226,etc.)

## **VI. Scientists and Government Panels or Bodies That Have Found Amalgam Fillings to be Unsafe.**

1. A World Health Organization Scientific Panel concluded that there is no safe level of mercury exposure (183,208,238). The Chairman of the panel, Lars Friberg stated that "dental amalgam is not safe for everyone to use (208,238).

2. In 1987 the Federal Dept. of Health in Germany issued an advisory warning against use of dental amalgam in pregnant women (61). A Swedish National Mercury Amalgam Review Panel found that "from a toxicological point of view, mercury is too toxic to use as a filling material" [164]. The US EPA found that removed amalgam fillings are hazardous and must be exposed of as hazardous waste (214). Most European countries require controls on dental waste amalgam emissions to sewers or air. A Canadian Government study for Health Canada concluded that any person with any number of amalgam fillings receives exposure beyond that recommended by the USPHS Standard (209). Many of those researching amalgam related health effects including several very prominent scientists have concluded that the health effects are widespread and serious so that mercury should not be used as a filling material (1,18,19,26,36,38,61)[88,94,99,100,113,115,125,126,148,153,164,170,183,208,

209,210,222,227,236,237,238,239].

3. The use of mercury amalgams has been banned for children and women of childbearing age or put on a schedule for phase out by 4 European countries. The use of amalgam is declining in Europe and Germany's largest producer of amalgam has ceased production, The director of the US Federal program overseeing dental safety advises against using mercury amalgam for new fillings.

### References to document : Dental Amalgam Scientific Facts

1. Sandra Denton MD; Proceedings of the First International Conference on Biocompatibility, 1988
2. EPA Mercury Health Effects Update Health Issue Assessment. Final report 1984 EOA-600/8- 84f. USEPA, Office of Health and Environmental Assessment; Washington DC 20460
3. Gordon - Pregnancy in Female Dentists- a Mercury Hazard. Proceedings of Intl conference on Mercury Hazards in Dental Practice Sept. 2-4 Glasgow 1981
4. Lee, L.P. Effects of Mercury on Spermatogenesis J Pharmacol Exp Thera 1975, 194(1); 171-181
5. Anonymous . Mercury in Fish . Bull WHO 64(5) : 634 1986
6. Schulein,T.M.; Reinhardt, J.W. and Chan K.C. Survey of Des Moines area dental offices for Mercury vapour. Iowa Dent. J. 70(1):35-36 1984
7. JonesDW, Sutton EJ, and Milner EL Survey of Mercury vapour in dental offices in Atlantic Canada.Can. Dent. Assoc. J. 4906:378-395, 1983
8. Miller RW and Ochua;. Report on independant survey taken of Austin dental offices for mercury contamination. Texas Dent. J. 100(1):6-9, 1983
9. Kantor,L. and Woodcock C, Mercury vapour in the dental office- does carpeting make a difference? JADA103(9):402-407,1981
10. Skuba, A. Survey for Mercury vapour in Manitoba dental offices J Can. Dent. Assoc. 50(7):517-522, 1984
11. Chop GF. and Kaufman EG. Mercury vapour related to manipulation of amalgam and to floor surfaces. Oper. Dent. 8(1):23-27,1983
12. RoydhouseRH. FergMR . and Knox RP. Mercury in dental offices J Can Dent Assoc 51(2):156-158, 1985
13. Butler J. Proceedings from the First International Conference of Biocompatibility. 1988
14. Magnus Nylander, Mercury Concentrations in the human brain and kidneys in relation to exposure from dental amalgam fillings ICBM 1988
15. Svare CW et.al. The effects of dental amalgam on Mercury levels in expired air. J. Dent. Res.60(9):1668-1671,1981
16. Ott K et. al. Mercury burden due to amalgam fillings Dtsch. Zahnarztl Z 39(9):199-205, 1984
17. Abraham J, Svare C , Frank C., The effects of dental amalgam restorations on Blood Mercury levels. J. Dent.Res. 63(1):71-73,1984
18. Vimy,MJ. Lorscheider,FL. Intra oral Mercury released from dental amalgams. J. Dent Res. 64(8):1069-1071.,1985 also see (238)
19. Matts Hanson. Amalgam hazards in your teeth., Dept of Zoophysiology., University of Lund, Sweden.J. Orthomolecular Psychiatry Vo12 No 3 Sept 1983
20. Vimy,MJ, Takahashi,Y, Lorscheider,FL Maternal -Fetal Distribution of Mercury Released From Dental Amalgam Fillings. Dept of Medicine and Medical Physiology , faculty of Medicine, Univ of Calgary, Calgary Alberta Cannada 1990 published in FASEB Also see (238)
21. Goyer RA Toxic effects of metals. Cassarett and Doull's toxicology--The basic science of poisons , ed3, New York , MacMillan Publ.Co 1986, pp582-609
22. KuhnertP, Kunhert BRR and Erhard P COmparison of Mercury levels in maternal blood fetal chord blood and placental tissue. Am. J. Obstet and Gynecol., 139:209-212., 1981
23. Kuntz WD- Maternal and chord blood Mercury background levels; Longitudinal surveillance. Am J Obstet and Gynecol. 143:440-443., 1982
24. BrodskyJB. Occupational exposure to Mercury in dentistry and pregnancy outcome. JADA111(11):779-780., 1985
25. Malmstr"m C., Hansson M., Nylander M., Conference on Trace Elements in Health and Disease. Stockholm May 25-1992

26. Lorscheider & Vimy The Lancet Vol 337; may 4, 1991. also see (238)
27. Matts Hanson. Why is Mercury toxic. Basic chemical and biochemical properties of Mercury/amalgam in relation to biological effects. ICBM conference Colorado 1988
28. Sheppard AR and Eisenbud M., Biological Effects of electric and magnetic fields of extremely low frequency. New York university press. 1977
29. Mareck and Hockman. Simulated crevice corrosion experiment for pH and solution chemistry determinations. CORROSION 1974:23;1000-1006.
30. Till et al. Zahnärztl. Welt/reform 1978:87;1130-1134.
31. Langan, Fan, Hoos. The use of Mercury in dentistry: a critical review of the literature. JADA Vol 115 December 1987., 867 Donated by The ADA
32. Jonnes, Suttow and Milner. Survey of Mercury vapour in dental offices in Atlantic Canada, Canadian Dental Association Journal., 49(6):378-395., 1983
33. Goyer Toxic Effects of Metals. Casaret and Doull's toxicology- the basic science of poisons. ed3 New York. Macmillan Publishing. 1986 pp582-609
34. Patrick Störtebecker Formerly Associate Professor of Neurology, Karolinska Institute, Stockholm.. Mercury Poisoning from Dental amalgam- a hazard to the human brain. Bio-Probe, Inc. ISBN: 0-941011001-1.
35. Hal Huggins. Observations From The Metabolic Fringe. ICBM conf. Colorado 1988
36. Sam Queen; Chronic Mercury Toxicity; New Hope Against an Endemic Disease. 2000
37. Mohamed et al. Laser Light Scattering Study of the Toxic Effects of Methylmercury on sperm motility. J Androl., 7(1):11-15., 1986.
38. Ziff S. and Ziff M. Infertility and Birth Defects: Is Mercury from Dental Fillings a Hidden Cause?, Bio-Probe, Inc. ISBN: 0-941011-03-8. 1987
39. Inouye M., Murao K., Kajiwara Y., Behavioral and neuropathological effects of prenatal methyl Mercury exposure in mice.. Neurobehav. Toxicol Teratol., 1985;7;227-232
40. Koos et al., Mercury toxicity in pregnant women, fetus and newborn infant. Am J Obstet And Gynecol., 1976:126;390-409
41. Khera et al., Teratogenic and genetic effects of Mercury toxicity. The biochemistry of Mercury in the environment Nriagu, J.O. Ed Amsterdam Elsevier, 503-18, 1979
42. Babich et al., The mediation of mutagenicity and clastogenicity of heavy metals by physiochemical factors. Environ Res., 1985:37;253-286
43. Hansen K et al A survey of metal induced mutagenicity in vitro and in vivo J Amer Coll Toxicol., 1984:3;381-430
44. Verchaeve L et al., Comparative in vitro cytogenetic studies in Mercury exposed human lymphocytes Mutation Res., 1985:157; 221-226.
45. Pelletier L et al., In vivo self reactivity of mononuclear cells to T cells and macrophages exposed to Hg Cl<sub>2</sub> Eur. J Immun., 1985: 460-465
46. Veron et al Amalgam Dentaires et allergies J Biol Buccale., 1986 : 14; 83-100
47. Huggins H., Its All In Your Head. 1990
48. Störtebecker P. Mercury Poisoning from Dental Amalgam: A Hazard to the Human Brain (Bio-Probe, Inc. 1985) ISBN:0-941011-01-1
49. Amalgam Hazards - an assessment of research By Irwin Mandel DDS Assoc. Dean for Research School of dental and Oral Surgery Columbia University New York Published JADA Vol. 122 August 1991
50. Nylander et al. Fourth international symposium Epidemiology in Occupational Health. Como Italy Sept 1985
51. Methylation of Mercury from dental amalgam and mercuric chloride by oral Streptococci. Heintz, Edwardson, Derand, Birkhed Scan. J. Dent. Res. 1983, 91:150-152
52. Bacterial Growth on Dental Restorative Materials in Mucosal Contact. Orstavik, Arneberg, Valderhaug Acta Odontol. Scand. 1981, 39:267-274
53. The Methylation of Mercuric Chloride by Human Intestinal Bacteria. Rowland, Grasso, Davies Experientia. Basel 1975, 31: 1064-1065
54. Formation of methyl Mercury Compounds from inorganic Mercury. by Clostridium cochlearium Yamada, Tonomura J Ferment Technol 1972 50:159-1660
55. Hanson, J Orthomolecular Psychiatry 1983, 12: 194-201 55a Amalgam Restorations and Mercury Toxicity. Dr P Sheridan, Masters Thesis, University of Sydney 1991
56. MARXKORS, R.: Korrosionserscheinungen an Amalgamfüllungen und deren Auswirkungen auf den

- Menschlichen Organismus. Das Deutsche Zahn rztebl. 24, 53, 117 and 170, 1970.
57. Campbel & M. Godfrey Research into provocation testing of DMPS - urine samples of Mercury.
58. Summers AO, Wireman J., Vimy MJ., IORSCHIEDER FLY., MARSHAL B., EVY SB., Bennet S., Billard L. J. Of Anti-microbial Agents and Chemotherapy 37[4]:825-34 April 1993 also see (238)
59. BOYD, N. D., H. BENEDIKTSSON, M. J. VIMY, D. E. HOOPER, AND F. L. LORSCHIEDER. Mercury from dental "Silver" tooth fillings impairs sheep kidney function. Am.J. Physiol. 261 (Regulatory Integrative Comp. Physiol. 30): R1010-R1014, 1991.-- See also (238)
60. Vera Stejskal, Sweden "MEMORY LYMPHOCYTE IMMUNO- STIMULATION ASSAY - MLISA"
61. Dr Gustav Drasch, Institute of Forensic Medicine, University of Munich. Public announcement 25 January 1994 Bio Probe March 1994; & "Mercury burden of human fetal and infant tissues", Euro.J. Pediatrics, Spring 1994, p607-610.
62. Dr W. Kostler., President of the Austrian Oncology Society. Paper presented at the World Congress on Cancer. April 1994 Sydney Australia.
63. World Health Organisation Env. Health Criteria 118 1991 Geneva Switzerland
64. Health damage due to exposure to mercury vapour (Mercury) Szko dy zdrowotne wywo lane narazieniem na pary rteci (Mercury). Moszczynski-P Jr; Moszczynski-P Czas-Stomatol. 1989 Apr; 42(4): 233-81989POLISH;POLAND
65. In vivo mercury and methyl mercury levels in patients at different intervals after amalgam restorations. Fung-YK; Molvar-MP; Strom-A; Schneider-NR; Carlson-MP College of Dentistry, University of Nebraska Medical Center, Lincoln. Northwest-Dent. 1991 May-Jun; 70(3) 23-6
- (66) Regional brain trace-element studies in Alzheimer's disease. Thompson CM Markesbery WR Ehmann WD Mao YX Vance In: Neurotoxicology (1988 Spring) 9(1):1-7
- (67) A search for longitudinal variations in trace element levels in nails of Alzheimer's disease patients. Vance DE Ehmann WD Markesbery WR In: Biol Trace Elem Res (1990 Jul-Dec) 26-27:461-70
- (68) K.A.Ritchie et al,"Psychomotor testing of dentists with chronic low level mercury exposure", J Dent Res 74:420, IADR Abstract 160(1995).
- (69) D Gonzalez-Ramirez et al; "Uninary mercury, porphyrins, and neurobehavioral changes of dental workers in Monterrey, Mexico", J Pharmacology and Experimental Therapeutics,, 272(1): 264-274,1995
- (70) N.J. Heyer et al, "Behavioral Effects of Low Level Exposure to HgO Among Dentists", Neurotoxicol Teratol 17(2):161-168(1995).
- (71) S.C.Foo et al, "Neurobehavioral effects in Occupational Chemical Exposure", Environmental Research, 60(2): 267-273, 1993.
- (72) D.L.Smith,"Mental effects of mercury poisoning",South Med J 71:904-5,1978.
- (73) RT McNerney et al, "Mercury Contamination in the Dental Office: A Review", NYS Dental Journal, Nov 1979, p457-458.
- (74) D.G. Mantyla et al, "Mercury toxicity in the dental office: a neglected problem", JADA, 92:1189-1194, 1976.
- (75) Katsunuma et al, "Anaphylaxis improvement after removal of amalgam fillings", Annals of Allergy, 1990, 64(5):472-75.
- (76) A. Schulte et al, "Mercury Concentrations in Children with and without Amalgam Restorations", J.Dent Res 73(4): 980 A-334.
- (77) I.Skare, "Mass Balance and Systemic Uptake of Mercury Released from Dental Fillings", Water, Air, and Soil Pollutio, 80(1-4):59-67, 1995.
- (78) G.Drasch et al, " Silver Concentrations in Human Tissues: the Dependence on Dental Amalgam",J Trace Elements in Medicine and Biology,9(2):82-7,1995.
- (79) L.Bjorkman et al, "Mercury in Saliva and Feces after Removal of Amalgam Fillings", J Dent Res 75: 38- IADR Abstract 165, 1996.
- (80) M.Osterblad et al, "Antimicrobial and Mercury Resistance among Persons with and without Amalgam Fillings", Antimicrobial Agents and Chem, 39(11):2499,1995
- (81) L.I.Liang et al, "Mercury reactions in the human mouth with dental amalgams" Water, Air, and Soil pollution, 80:103-107.
- (82) J.Begerow et al,"Long-term mercury excretion in urine aft4er removal of amalgam fillings", Int Arch Occup Health 66:209-212, 1994.
- (83) I.et al, "Human Exposure to Hg and Ag Released from Dental Amalgam Restorations", Archives of Environmental Health 49(5):384-394, 1994.
- (84) J.E.Abraham et al, "The Effect of Dental Amalgam Restorations on Blood Mercury Levels", J Dent

Res 63(1): 71-73, 1984

(85) J.A.Weiner et al,"The relationship between mercury concentration in human organs and predictor variables",138(1-3):101-115,1993; & "An estimation of the uptake of mercury from amalgam fillings", Sci Total Environ,v168,n3,1995.

(86) E.R.Smart et al, "Resolution of lichen planus following removal of amalgam restorations", Br Dent J 178(3): 108-112,1995.

(87) A. Skoglund, Scand J Dent Res 102(4): 216-222, 1994; and 99(4):320-9,1991.

(88) M.Godfrey et al, Confirmation of mercury retention and toxicity using DMPS", J Advance Med 7(1):19-30, 1994.

(89) M.Molin et al, "Kinetics of mercury in blood and urine after amalgam removal", J Dent Res 74:420, IADR Abstract 159, 1995.

(90) P.Koch et al, "Oral lichenoid lesions,mercury hypersensitivity, ...", Contact Dermatitis, 33(5):323-328.

(91) B. Lindqvist et al, "Effects of removing amalgam fillings from patients affecting the immune system", Med Sci Res 24(5): 355-356, 1966.

(92) L. Tandon et al, "Elemental imbalance studies by INAA on ALS patients", J Radioanal Nuclear Chem 195(1):13-19,1995; .

(93) L.Barregard et al, "People with high mercury uptake from their own dental amalgam fillings", Occup Envir Med 52: 124-128, 1995.

(94) F.Berglund, Case reports spanning 150 years on the adverse effects of dental amalgam, Bio-Probe, Inc., Orlando, FL, 1995; ISBN 0-9410011-14-3.

(95) H.J.Lichtenberg, "Elimination of symptoms by removal of dental amalgam from mercury poisoned patients", J Orthomol Med 8:145-148, 1993.

(96) R. Stromberg et al, "A case of unusually high mercury exposure from amalgam fillings", Tandlakartidningen 88(10): 570-572, 1996.

(97) O. Redhe et al, "Recovery from ALS after removal of dental amalgam fillings", Int J Risk & Safety in Med 4:229-236, 1994.

(98) A. Seidler et al, "Possible environmental factors for Parkinson's disease",Neurology 46(5):1275-1284, 1996; & F.O.Vroom et al, "Mercury vapor intoxication", Brain 95: 305-318, 1972; Ohlson et al, "Parkinsons Disease and Occupational Exposure to Mercury", Scand J. Of Work Environment Health, Vol7, No.4: 252-256, 1981..

(99) M.Nylander et al, Mercury accumulation in tissues from dental staff and controls", Swedish Dental Journal, 13:235-243, 1989.

(100) M.E. Godfrey, "Chronic illness in association with dental amalgam", J Adv Med 3:247-255, 1990; & M.Hanson et al, "The dental amalgam issue: a review", Experientia, 47:9-22,1991.

(101) E.Henriksson et al, "Healing of Lichenoid Reactions followin Removal of Amalgam", J Clinical Periodontol, V22,N4, p287-94,1995.

(102) R.L. Siblingrud et al,"Evidence that mercury from silver fillings may be an etiological factor in multiple sclerosis", Sci Total Environ,v142,n3,p191 , 1994; & "Mental health, amalgam fillings, and MS", Psychol Rep, 70(3 Pt2), 992, 1139-51; & T.Engalls,Am J Forensic Med Pathol, 4(1):1983, Mar, 55-61.

(103) A.P.Tanchyk,"Amalgam Removal for Treatment of Arthritis", Gen Dent, v42,n4, July 1994, p354-

(104) G.Drasch et al, "Mercury burden of human fetal and infant tissues", Europeon J Pediatr, v153,n8, p607-10, 1994.

(105) B.Windham, "Health, Hormonal, and Reproductive Effects of Endocrine Disrupting Chemicals" (including mercury), Annotated Bibliography ,1996.

(106) G.R.Bruce,"Cytotoxicity of retrofil materials", J Endod, v19,n6,p288-92, 1993

(107) R.L.Siblingrud et al, Psychometric evidence that mercury from dental fillings may be a factor in depression,anger,and anxiety", Psychol Rep, v74,n1,1994 ; & Amer. J. Of Psychotherapy, 1989; 58:575-87.

(108) M.Henningsson et al,"Defensive characteristics in individuals with amalgam illness", Acta Odont Scand 54(3): 176-181,1996.

(109) Y.X. Liang et al,"Psychological effects of low exposure to mercury vapor",Environ Res, 60(2): 320-327, 1993; & T.Kampe et al, "Personality traits of adolescents with intact and repaired dentitions",Acta Odont Scand,44:95-,1986

(110) N.Roeleveld et al, "Mental retardation and parental occupation", Br J Ind Med 50(10):945-954, 1993.

(111) M.Nylander et al, "Mercury concentrations in the human brain and kidneys and exposure from

- amalgam fillings", *Swed Dent J* 11:179-187, 1987.
- (112) A.Oaskarsson et al, "Exposure to toxic elements via breast milk", *Analyst*, 120(3): 765-770, 1995.
- (113) M.J.Vimy et al, "Maternal-fetal distribution of mercury released from amalgam fillings", *Am J Physiol* 258:R939-R945,1990. See also (238)
- (114) G.Drasch et al, *Eur J Pediatr* 153:607-610,1994. See also (239)
- (115) VDM Stejskal et al, "MELISA: tool for the study of metal allergy", *Toxic in Vitro*, 8(5):991-1000, 1994.
- (116) A.O.Summers et al, *Antimicrobial Agents and Chemotherapy*,37(4):825-834, 1993; & *The Physiologist* 33(4), A-116,1990; & M.Vimy et al, "Silver dental fillings provoke an increase in mercury and antibiotic resistant bacteria in the mouth and intestines of primates", *APUA Newsletter*, Fall, 1991.
- (117) C.Edlund et al, "Resistance of the Normal Human Microflora to mercury and antimicrobials", *Clin Infect Dis* 22(6):944-950, 1996.
- (118) L.Tibbling et al, "Immunological and brain MRI changes in patients with suspected metal intoxication", *Int J Occup Med Toxicol* (2):285-294,1995.
- (119) L.Ronnback et al, "Chronic encephalopathies induced by low doses of mercury or lead", *Br J Ind Med* 49:233-240, 1992.
- (120) L.Pohl, "The dentist's exposure to elemental mercury during clinical work", *Acta Odontol Scand*,v53,n1,p44-48,1995.
- (121) A.S.Rowland et al,"The Effect of Occupational Exposure to mercury vapor on the fertility of female dental assistants",*Occup Environ Med*, v55,n1,1994
- (122) K.A.Ritchie et al, "Psychomotor testing of dentists with chronic low level mercury exposure", *J Dent Res* 74:420 IADR Abstract 160 (1995).
- (123) I. Skare et al, "Mercury exposure of different origins among dentists and dental nurses", *Scand J Work Environ Health*, 16:340-347, 1990.
- (124) I.Akesson et al, "Status of mercury and selenium in dental personnel", *Arch Environ Health*, 46(2): 102-109, 1991 & J.Lenihan et al, "Mercury hazards in dental practice", *British Dental J*, 135:363-376, 1973.
- (125) G. Hall, "Perspectives of Amalgam and Other Dental Materials", *European Academy Symposium Article*, Ostzenhausen,Germany, April 29, 1994.
- (126) F.L.Lorscheider et al, "Mercury exposure from silver tooth fillings: emerging evidence questions a paradigm", *FASEB J* 9:504-508,1995.
- (127)P. Moszczynski et al, "The behavior of T-Cells in the blood of workers exposed to mercury",*Med Lav* 85(3):239-241,1994; & "Lymphocytes, T and NK cells in men exposed to mercury",*Int J Occup Med Environ Health*,8(1):1995.
- (128) M.L.S.Queiroz et al, "Immunoglobulin Levels in Workers Exposed to Inorganic Mercury", *Pharmacol Toxicol* 74:72-75, 1994.
- (129) P.Hultman et al,"Adverse immunological effects and immunity induced by dental amalgam" *FASEB J* 8:1183-1190, 1994.
- (130) S. Enestrom et al, "Does amalgam affect the Immune System?" *Int Arch Allergy Immunol* 106:180-203,1995.
- (131) S.Ellermann-Eriksen et al, "Effect of mercuric chloride on macrophage-mediated resistance mechanisms against infection", *Toxicology*, 93:269- 297,1994.
- (132) K.Sato et al, "An epidemiological study of factors relating to mercury sensitization", *Aerugi* 44(2): 86-92, 1995.
- (133) M.Molin et al, "Mercury in plasma in patients allegedly subject to oral galvanism", *Scand J Dent Res* 95:328-334, 1987.
- (134) A.M.Aronsson et al, "Dental amalgam and mercury", *Biol Metals* 2:25- 30,1989.
- (135) L.Bjorkman et al, "Factors influencing mercury evaporation rate from dental amalgam fillings", *Scand J Dent Res*, 100(6): 354-360, 1992.
- (136) D. Gay et al, "Chewing releases mercury", *Lancet*, 8123:985-98, 1979.
- (137) B.Fredin, "Studies on the Mercury Release from Dental Amalgam Fillings", *Swed J Biol Med No.3*, 1988, pp8-15 & Summers,*Science News*, 4-10-93.
- (138) D. Zander et al, "Studies on Human Exposure to Mercury Amalgam Fillings", *Zbl Hyg* 190: 325-334, 1990.
- (139) G. Sallsten et al, "Long term use of nicotine chewing gum and mercury exposure from dental

- amalgam", *J Dent Res* 75(1):598,1996.
- (140) R.L.Siblerud, "Health Effects After Dental Amalgam Removal", *J Orthomolecular Med* 5(2): 95-106.
- (141) R.L.Siblerud et al, "Evidence that mercury from dental fillings may be an etiological factor in smoking", *Toxicol Lett*,v68,n3,1993,p307- & v69(3):305.
- (142) M.E.Ariza et al, "Mutagenic effect of mercury", *InVivo* 8(4):559-63,1994.
- (143) P.Boffetta et al, "Carcinogenicity of mercury", *Scand J Work Environ Health*, 19(1):1-7,1993; & *J Occup Med*, 36(11):1260-64, 1994.
- (144) V.Y Zaichick et al,"Trace Elements and thyroid cancer",*Analyst*, 120(3),1995.
- (145) D.E. Swartzendruber, *Med Hyptheses*, 1993, v41,n1, p31-34.
- (146) T.Colborn(Ed.),*Chemically Induced Alterations in Functional Development*, Princeton Scientific Press,1992 & *Developmental Effects of Endocrine- Disrupting Chemicals*,*Environ Health Perspectives*, V 101, No.5, Oct 1993.
- (147)J.M.Wood,"Mechanisms for the Neurotoxicity of Mercury", in *Organotransitional Metal Chemistry*, Plenum Publishing Corp, N.Y, N.Y, 1987. & R.P. sharma et al, "Metals and Neurotoxic Effects", *J of Comp Pathology*, Vol 91, 1981.
- (148) H.R.Casdorff, *Toxic Metal Syndrome*, Avery Publishing Group, 1995.
- (149) B.Choi et al, "Abnormal neuronal migration of human fetal brain", *Journal of Neurophology*, Vol 37, p719-733, 1978; & L.Verschaeve, "Genetic damage induced by mercury exposure", *Environ Res*,12:306-10,1976.
- (150) U.S. Public Health Service, "Toxicological profile of Mercury", 1988. & J.Leiskir,"Cytotoxicity of Silver amalgam", *Scand J of Dental Res*, 1974.
- (151) Electric Power Research Institute, EPRI Technical Brief:"Mercury in the Environment", 1993; & EPRI Journal, April 1990.
- (152) Langworth et al, "Effects of low exposure to inorganic mercury on the human immune system", *Scand J Work Environ Health*, 19(6): 405-413.1993.
- (153) International Academy of oral Medicine and Toxicology, "A Scientific Response to the American Dental Association Special Report and Statement of Confidence in Dental Amalgam, IAOMT, POB 608531, Orlando,32860- 8531.
- (154) E.Djera sci et al, *Int Dent J* 19:481-8,1969; & A.M.Robinson et al, "Contact Dermatitis due to Amalgam fillings",*Arch Dermatol Syphilol*, 59:p116-8,1949; & R.R.White et al, *J Amer Dent assoc*, 92:124-7,1976; & K.Nordlind et al, "Patch test reactions to metal salts in patients with oral mucosal lesions associated with amalgam fillings", *Contact Dermatitis*,1992, 27:3, 157-160.
- (155) L.D.Koller, "Immunotoxicology of Heavy Metals", *Int J of Immunopharm*, 2:269-279,1980; & *Amer J Vet Res*, vol34,p1457-,1973.
- (156) E.G.Miller et al, "Prevalence of Mercury Hypersensitivity among Dental Students", 64:Abstract 1472, p338,1985.
- (157) L.J Goldwater, "Toxicology of Inorganic Mercury", *Annals: NY Acad Sci*, 65:498-503,1957; & J.B.Nielsen et al, "Evaluation of Mercury in Hair & Blood as Biomarkers for Methylmercury Exposure", *Arch of Toxicology*, 1994,65(5):317-321.
- (158) Wenstrup et al, "Trace element imbalances in the brains of Alzheimers patients",*Brain Research*, Vol 533,p125-131,1990; & D.W. Eggleston et al, *J Prosthet Dent*, 1987,58(6),704-7; and *Journal of the American Medical Assoc.*, Sept 96.
- (159) L.D. Koller, "Immunotoxicity of heavy metals", *Int J of Immunopharmacology*, V2,p269,1980; & *Amer j Vet Res*, Vol 34,1457,1973.
- (160)B.Windham, "Health Effects of Toxic Metals: An Annotated Bibliography",1995.
- (161) F.L.Lorscheider et al, "Inorganic mercury and the CNS; genetic linkage of mercury and antibiotic resistance",*Toxicology*,1995,97(1): 19-22.
- (162) N.K.Mottet et al, "Health Risks from Increases in Methylmercury Exposure",vol63:133-140,1985.
- (163) Ahlrot et al, *Nutrition Research*, 1985 Supplement, & *Second Nordic Symposium on Trace Elements and Human Health*, Odense, Denmark, Aug 1987.
- (164) Swedish National Dept. of Health, *Mercury Amalgam Review Panel*, 1987.
- (165) G.Anneroth et al, "Comprehensive Medical Examination of patients with alleged adverse effects from dental amalgams", *Acta Odontol Scand*, 1992,50(2):101-11.
- (166) H.Basun et al, *J Neural Transm Park Dis Dement Sect*, "Metals in plasma and cerebrospinal fluid in normal aging and Alzheimer's disease",1991,3(4):231- 58

- (167) R. Brehler et al, "Mercury sensitization in amalgam fillings", *Dtsch med Wochenschr*, 1993, 118(13):451-6.
- (168) J. Laine et al, "Resolution of oral lichenoid lesions after replacement of amalgam restorations", *Br J Dermatol*, 1992, 126(1):10-15.
- (169) C. H. Ngim et al, *Neuroepidemiology*, "Epidemiologic study on the association between body burden mercury level and idiopathic Parkinson's disease", 1989, 8(3):128-41.
- (170) R. L. Sibley et al, "A comparison of mental health of multiple sclerosis patients with silver dental fillings and those with fillings removed", *Psychol Rep*, 1992, 70(3), Pt 2, 1139-51.
- (171) A. Jokstad, "Mercury excretion and occupational exposure of dental personnel", *Community Dent Oral Epidemiol*, 18(3):143-8, 1990.
- (172) B. Nilsson et al, "Urinary mercury excretion in dental personnel", *Swed Dent J*, 1986, 10(6):221-32.
- (173) D. Zanders et al, "Mercury exposure of male dentists, female dentists, and dental aides", *Zentralbl Hyg Umweltmed*, 1992, 193(4):318-28.
- (174) B. Willershausen et al, "Mercury in the mouth mucosa of patients with amalgam fillings", *Dtsch Med Wochenschr*, 1992, 117:46, 1743-7.
- (175) L. Larkfors et al, "Methylmercury induced alterations in the nerve growth factor level in the developing brain", *Brain Res Dev Brain Res*, 62(2), 1991, 287-
- (176) A. Jokstad et al, "Dental amalgam and mercury", *Pharmacol Toxicol*, 70(4), 1992, 308-13.
- (177) S. Olsson et al, "Daily dose calculations from measurements of intra-oral mercury vapor", *J Dent Res*, 71(2):414-23, 1992.
- (178) K. Nordlind et al, "Patch test reactions to salts in patients with amalgam restorations", *Contact Dermatitis*, 27(3):157-60, 1992.
- (179) A. Lussi, "Mercury release from amalgam into saliva", *Schweiz Monatsschr Zahnmed*, 103(6):722-6, 1993.
- (180) O. F. Pinto et al, *J Intl Acad Prev Med*, Vol 3, No. 2, 1976.
- (181) R. P. Sharmo et al, "Metals and neurotoxic effects", *J Comp Pathol*, 91:235, 1981.
- (182) J. Pleva, *J Orthomol Psych*, Vol 12, No. 3, 1983 & *J. Of Orthomol. Medicine* 1989, 4:141-148..
- (183) World Health Organization (WHO), 1991, *Environmental Health criteria* 118, *Inorganic Mercury*, p36, WHO, Geneva; & W. Craeli, *J Epidemiology and Community Health*, 32:155-65, 1978.
- (184) T. H. Ingalls, *J Forensic Med and Path*, Vol 4, No 1, 1953.
- (185) U. Heintze, *Scand J Dent Res*, 1983, 1991:150-2.
- (186) H. Reden, *Odont Revy*, 25, 1971, 207-210.
- (187) P. A. Gronla et al, *JADA*, 1970, 81:923-25.
- (188) I. I. Ship et al, *School of Dental Research, Univ of Penn.*, Mar 1983.
- (189) WHO and U.S. CDC, *Toxicology Division*, Atlanta, Ga.
- (190) T. B. Eyl, *Mod Med*, Vol 38, 1970.
- (191) C. Brune et al, *Scand J Dent Res*, 1983, 19:66-71.
- (192) L. J. Calsakis et al, "Allergy to Silver Amalgams", *Oral Surg*, 46:371-5, 1978
- (193) D. D. Gay et al, 1979, *Lancet*, May 5, 1985 & C. W. Svare et al, *J Dent Res*, "The effects of amalgams on mercury levels in expired air", 60, 1981, p1668-.
- (194) T. Fusayama et al, *J Dental Res*, 1963, 42:1183-1197.
- (195) Koos & Loongo, "Pregnancy ...", *Pediatrics*, Vol 64, No. 5, Nov 1970.
- (196) Gowdy & Demes, 1978, in (47).
- (197) J. Taylor, *A Complete Guide to Mercury Toxicity from Dental Fillings*, Scripps Publishing.
- (198) E. S. West et al, *Textbook of Biochemistry*, MacMillan Co, 1957, p853.
- (199) I. Gerhard et al, *Tubingen Univ. Gynecological Clinic, Heidelberg*, 1996.
- (200) S. Langworth et al, "A case of high mercury exposure from dental amalgam", *Eur J Oral Sci* 104:320-321, 1996.
- (201) J. T. Solonen et al, "Intake of mercury from fish and the risk of myocardial infarction and cardiovascular disease in eastern Finnish men", *Circulation*, 1995; 91(3):645-55.
- (202) T. Kishimoto et al, "Methylmercury injury of Cultured Human Vascular Endothelial Cells", *Journal of Trace Elements in Experimental Medicine*, 6(4): 155-163, 1993.
- (203) S. Eti et al, "Renal Effect of Mercury from amalgam fillings", *Pharmacology & Toxicology*, 1995, 76(1): 47-9.
- (204) W. D. Kuntz et al, "Maternal and cord blood background mercury levels", *American Journal of Obstetrics & Gynecology*, 1982; 143(4): 440-3.

- (205) M.F. Ziff et al, A Persuasive New Look at Heart Disease As It Relates to Mercury, Bio-Probe, Inc., ISBN 0-941011-08-9.
- (206) R. Ma et al, "Association between dental restorations and carcinoma of the tongue", European Journal of Cancer. Part B, Oral Oncology, 1995; 31B(4): 232-4.
- (207) Boyd Haley, Univ. Of Kentucky, "The Toxic Effects fo Mercury on CNS Proteins: Similarity to Observations in Alzheimer's Disease", IAOMT Symposium paper, March 1997.
- (208) L.T.Friberg, "status Quo and perspectives of amalgam and other dental materials", International symposium proceedings, G.Thieme Verlag Struttgart, 1995.
- (209) Mark Richardson, Environmental Health Directorate,Health Canada, Assessment of Mercury Exposure and Risks from Dental Amalgam, 1995 (peer-reviewed report); & Bio-Probe Newsletter, May 1996.
- (210) Mats Berlin, "Is amalgam in dental fillings hazardous to health?", Lakartidningen, 1992; 89(37):2918-23.
- (211) M.J.Vimy and F.L. Lorscheider, Faculty of Medicine, Univ. Of Calgary, July 1991. (Study findings) & J. Dent. Res. 1985, 64:1069-75; & J. Trace Elem. Exper. Med., 1990,3, 111-123.
- (212) Ziff, M.F., "Documented clinical side effects to dental amalgams", ADV. Dent. Res., 1992; 1(6):131-134.
- (213) Dr. C. Kousmine, Multiple Scherosis is Curable, 1995.
- (214) "Amalgam declared hazardous", Dentistry Today, February, 1989, p1.
- (215) K.W. Sehnert, "Autoimmune Disorders", Advance, Jan 1995, p47-48.
- (216) F.L. Lorscheider et al, Lancet, 1991, 337,p1103; & T.W. Clarkson et al, in Biological Monitoring of Toxic Metals, Plenum Press, N.Y., p247-260; & Environmental Health Perspective, 1993, April, 100:31-8.
- (217) Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, "Toxicological Profile for Mercury"(ATSDR TP93/10), 1994.
- (218) A. Seidler et al, "Possible environmental or occupational factors for Parkinson's Disease", Neurology, 1996; 46(5): 1275-84.
- (219) D.E. Cutright et al, "Systemic mercury levels caused by inhaling mist during hig-speed amalgam grinding", J Oral Med 28(4):100-104,1973 ; & A.Nimmo et al, "Inhalation during removal of amalgam restorations", J Prosthet Dent, 63(2):1990 Feb, 228-33.
- (220) C Arch Environmental Health, 19,891-905, Dec 1969.
- (221) R. Golden et al, Duke Univ., "Dementia and Alzheimer's" Disease", Minnesota Medicine, 78:p25-29, 1995.
- (222) M. Dauderer, "Improvement of Nerve and Immunological Damages after Amalgam Removal", Amer. J. Of Probiotic Dentistry and Medicine, Jan 1991.
- (223) Nicholson et al, "Mercury Nephrotoxicity", Nature Vol 304: 633, 1983; & Friberg et al, "Kidney injury after chronic exposure to inorganic mercury", Archives of Environ Health, Vol 15:p64, 1967; & Kazantis et al, "Nephrotic Syndrome Following Exposure to Mercury", Quarterly J. Of Medicine, Vol 31: 403-418, 1962; & L.H.Lash, Environmental Health Perspective,1994,102(11).
- (224) M.S. Hughes, Amer. J. Of Obstetrics and Gynecology, vol 143, No 4:440- 443, 1982.
- (225) S. Yannai et al, "Transformationss of inorganic mercury by candida albicans and saccharomyces cerevisiae", Applied Envir Microbiology,1991, 57:245-247; & I.R.Rowland et al, "The methylization of mercuric chloride by human intestinal bacteria", Experientia, Sept 1975, 31(9):1064-5..
- (226) P.W. Mathieson, "Mercury: god of TH2 cells", Cliical Exp Immunol., Nov 1995, 102(2):229-30; & B.J. Shenker et al, Univ. Of Pennsylvania School of Dental Medicine, "Mmmune suppression of human T-cell activation", Immunopharmacological Immunotaxical, 1992, 14(3):539-53; & M.M.Christensen et al, Arch. Toxicol, 1993, 3:67:2050211; & M. Kubicka et al, "Autoimmune disease induced by mercuric choride", Int Arch Allergy Immunol, Jan 1996, 109(1):11-20; & L.Pelletier et al, "Autoreactive T cells in mercury induced autoimmune disease", J Immunol, Oct 1986 137(8):2548-54.
- (227) Dr. Pierre blais, Health Canada, 1976 & Discovery, Feb 1997 (TV,Quebec)
- (228) Dr. T. Rau, Paracelsus Alergy Clinic, Lustmuhle, Switzerland, 1996(www).
- (229) M.Davis et al, Relealing the Mystery of "Silver Fillings", DAMS, Iowa
- (230) S. Rogers, M.D., Chemical Sensitivity, Keats Publishing,
- (231) Larsen,A.H. et al,"Mercury Discharge in Waste Water from Dental Clinics" Water Air and Soil Pollution, Jan 1996: 86(1-4): 93-99 & Rubin, P.g. et al, Archives of Environmental Health, Juul 1996; 51(4):335-337 & A. Lindvall et al, "Mercury in the Dental Practice: Contamination of Ambient Air and Waste Water, FDI World Dental Congress, Aug 19,1993, Goteborg, Sweden.

- (232) Adolph Coors Foundation, "Coors Amalgam Study: Effects of placement and Removal of Amalgam fillings", 1995. (www)
- (233) Sven Langworth et al, Amalgamnews and Amalgamkade fonden, 1997. (www)
- (234) P.E. Bigazzi, "Autoimmunity and Heavy Metals", Lupus, 1994; 3: 449-453.
- (235) H.J.Hamre, Mercury from Dental Amalga and Chronic Fatigue Syndrom", The CFIDS Chronicle, Fall 1994, p44-47.
- (236) G.J.Murphy, American Academy of Head, Neck, and Facial Pain, Oct 21, 1994
- (237) "Compilation of health consequences resulting from amalgam removal of 1569 patients", Foundation For Toxic-Free Dentistry, (compiled by type of health problem and consequences after removal for 31 major types of health problems) , Bio-Probe Home Page(www), 1997
- (238) World Health Organization Scientific Panel Members( Dr. Lars Friberg- chairman, Dr. Fritz Lorscheider, Professor of Medical Physiology, Univ. Of Calgary; Dr. Murray Vimy, Professor of Oral Biology and Dental Medicine, Univ. Of Calgary Medical School. \*\*\*
- (239) Dr. Vasken Aposhian, Dept. Head, Molecular and Cellular Biology, Univ. Of Arizona; Dr. David Eggleston, Univ. Of California, researcher on mercury in the brain; Dr. Boyd Haley, Univ. Of Kentucky researcher on mercury in the brain and Alzheimer's Disease; Dr. Gustav Drasch, Univ. Of Munich, researcher on mercury in brains of dead infants and fetuses; Dr. D. Echeverria, Neuro-Toxicologist, researcher on reproductive problems and birth defects in dental workers; BBC Panorama Program on Dental Amalgam: "The Poison in Your Mouth", June 1994.