

22.

**Summary of Testimony of  
Bernard Windham**

## **I. Mercury toxicity and immune reactivity(allergy)**

(note: the numbers in parentheses represent reference numbers of peer reviewed or Government studies. These will be provided as a handout)

The main issue regarding mercury and mercury's effects on people is toxicity, not allergy(immune reactivity). Mercury is well documented by U.S. Government Agencies to be one of the most toxic substances, and a lot more toxic than most poisons that people commonly might come in contact with(217,2). Mercury is highly toxic and has effects at extremely low levels so its hard for many to understand how so little exposure can cause such extreme effects. The following are two examples of how toxic mercury has been proven to be.

The U.S. Environmental Protection Agency(EPA) drinking water standard for mercury is 2 parts per billion(ppb). A large study was carried out at the Univ. Of Tubingen Health Clinic in which the level of mercury in saliva of 20,000 persons with amalgam fillings was measured(199). The level of mercury in unstimulated saliva was found to average 11.6 ppb, with the average after chewing being 3 times this level. Several were found to have mercury levels over 1100 ppb, 1 % had unstimulated levels over 200 ppb, and 10 % had unstimulated mercury saliva levels of over 100 ppb. The level of mercury in saliva was found to be proportional to the number of amalgam fillings, and generally was on average 1.5 ppb higher for each additional amalgam filling(199). Thus those with amalgam fillings were found to have levels of mercury exposure documented to be dangerous by the U.S. EPA.. Other studies cited later found similar results.

Another example is especially relevant to Florida. **If the amount of mercury in one amalgam filling(½ gram) is spread evenly among all of the fish in a 10 acre lake, all of the fish would be toxic and dangerous to eat(151,160,2).** A warning would be issued by a Government agency. **Over half the rivers and lakes in Florida have such health warnings banning or limiting eating of fish.** [ Florida Department of Health, Bureau of Environmental Toxicology, Health Advisories for Mercury in Florida Fish 1997; 10-15.] **Florida panthers and wading birds are documented to have died from mercury poisoning from eating fish and fish eating predators(104).** **Amalgam fillings are well known to be a major source of the mercury in such fish, from the mercury in dental offices and home sewers of those with amalgam fillings** [www.home.earthlink.net/~berniew1/damspr2s.html] (provided) This is one of the reasons some countries such as Sweden have recommended to ban or limit use of mercury in dentistry. The standard used in this example is an old standard. Studies including the National Academy of Sciences study(441) have found that the level appears to be too high to protect infants from developmental damage by mercury. These studies have found that 50% of U.S. infants currently are affected by developmental disabilities responsible for conditions like ADD, autism, dyslexia, mood and anxiety disorders, etc. The majority are documented by studies to be related to toxic effects with mercury documented by Government agencies(276) to be one of the largest factors. (www.home.earthlink.net/~berniew1/damspr4.html)

**But it is also well documented that millions of people are allergic/immune reactive to mercury and have adverse health effects.**

Of the many thousands who have had the immune reactivity(allergy) test from the Clifford Medical Lab(445), **93% tested immune reactive to mercury.** This is because of mercury's extreme toxicity. Mercury has an adverse effect on a high percent of people's immune system, which is responsible for this result. While the effect is not enough to debilitate most of these, it does affect them adversely. But for the more susceptible of these the result is debilitating.

Of the over 3,000 patients tested for blood lymphocyte reactivity to metals at a medical lab(60,342,375), **the following were the percentages testing positive: inorganic mercury- 23%, phenol mercury- 13%.** Among those with chronic immune conditions, the percentages were much higher. Other studies have also found relatively high rates of allergic reactions to inorganic mercury and nickel(81,35,445,456). Inorganic mercury is the most relevant form in amalgam and phenol is used in many root canals. The majority of these people tested suffered from chronic conditions, and the majority had significant improvements in their condition and had their immune reactivity decrease after amalgam replacement(peer-reviewed medical studies) **Of a group of 86 patients with Chronic Fatigue Syndrome symptoms, 78% reported significant health improvements after replacement of amalgam fillings within a relatively short period, and MELISA test found significant reduction in lymphocyte reactivity compared to pre removal tests(342,369,375).** The improvement in symptoms and lymphocyte reactivity imply that most of the Hg-induced lymphocyte reactivity is allergenic in

nature. Patients with other systemic neurological or immune reactive symptoms such as arthritis, myalgia, eczema, CFS, MS, lupus, ALS, diabetes, epilepsy, Hashimoto's thyroiditis, Scleroderma, oral lichen planus, etc. also often recover or improve significantly after amalgam replacement (12,35,60,113,168b,212,222,229,313,323, 342,369,375,453,459,etc.).

[[www.home.earthlink.net/~berniew1/hgremove.html](http://www.home.earthlink.net/~berniew1/hgremove.html)]

**Toxic/allergic reactions to mercury 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(60,75,78,82,86, 87,90,94,101,118,133,168,313).** These are peer-reviewed studies and this is well known in the dental community. **A high percentage of patients with oral mucosal problems along with other autoimmune problems such as CFS have significant immune reactions to mercury (46,60,118,313,81,90,212,313,342,369,375,456,468)** 94% of such patients had significant immune reactions to inorganic mercury(MELISA test) and 72% had immune reactions to low concentrations of HgCl<sub>2</sub>(<0.5 ug/ml). Although patch tests for mercury allergy are often given for unresolved oral symptoms, this is not generally recommended as a high percentage of such problems are resolved irrespective of the outcome of a patch test(87,86,90,101,168,etc.)

**Dental students(and dentists) get more exposure than most people and are a good example of allergic effects.** A review of several studies of mercury level in hair or nails of dentists and dental workers found median levels were 50 to 300% more than those of controls(38, p287-288,& 10,16,178). A group of dental students taking a course involving work with amalgam had their urine tested before and after the course was over. The average urine level increased by 500% during the course(63). Allergy tests given to another group of dental students found 44% of them were allergic to mercury(156). Studies have found that the longer time exposed, the more likely to be allergic and the more effects(6b,154c,156,503a) . One study found that over a 4 year period of dental school, the sensitivity rate increased 5 fold to over 10%(154c). Another group of dental students had similar results(362), while another group of dental student showed compromised immune systems compared to medical students. The total lymphocyte count, total T cell numbers(CD3), T helper/ inducer(CD4+CD8-), and T suppressor/cytotoxic(CD4-CD8+) numbers were significantly elevated in the dental students compared to the matched control group(408). Similar results have been seen in other studies as well(408).  
References: [www.home.earthlink.net/~berniew1/amalg6.html](http://www.home.earthlink.net/~berniew1/amalg6.html) (to be supplied)

## II. Common Mercury Exposure Levels from Amalgam Fillings

### 1. Exposure Mechanisms and Paths of Mercury from Amalgam

**The mercury in amalgam mixtures is elemental mercury. Mercury in the presence of other metals in the oral environment undergoes galvanic action, causing movement out of amalgam and into the oral mucosa and saliva (174,182,192,436,525,179,199).** For this reason some amalgam manufacturers such as Dentsply in their Material Data Safety Sheet given to dentists have warned that amalgam should not be used in the proximity of other metals(see MDSS). Some countries such as Canada, Sweden, etc. also have such warnings. Mercury in solid form is not stable due to low vapor pressure and evaporates continuously from amalgam fillings in the mouth, being transferred over a period of time to the host(15-19,26,31,36,79,83,211,182,183, 199,298,299,303, 332,335,371). Some studies have also found persons with chronic exposure to electromagnetic fields(EMF) such as computer monitors to have higher levels of mercury exposure and excretion (28) due to the induced currents in their mouth, and higher likelihood of getting chronic conditions like ALS(526). High levels of mercury are usually found in the mouth air of those with amalgam fillings with the highest levels of exposure of those with amalgam fillings being from mercury vapor.

**Much of the mercury originating from exposure to elemental vapor or inorganic mercury in saliva, blood and brain is organic (220,272), since mouth bacteria and other organisms such as bacteria and yeast in the intestines methylate inorganic mercury to organic mercury (51,81,225,503b,506,512).** Bacteria also oxidize mercury vapor to the water soluble, ionic form Hg(II) (431) which rapidly crosses cell membranes and forms inorganic compounds in the various organ cells where it is pumped by the heart. Thus the half life of mercury vapor in the blood is less than 1 minute (370). A clinical study found that methyl mercury in saliva is significantly higher in those with amalgam fillings than those without, and correlated with the number of amalgam fillings(506). Other studies have found similar results(512). **The largest amounts of mercury accumulate in the major organs that receive the most blood- the heart, brain, liver, kidneys (59,85,205,273,348).** Significant levels of mercury also accumulate in the oral cavity(174,192) and hormonal glands (19,20,25,85,99,273).

**The main exposure paths for mercury from amalgam fillings are absorption by the lungs from intraoral air; vapor absorbed by saliva or swallowed; amalgam particles swallowed; and membrane, olfactory, sublingual venal, and neural path transfer of mercury absorbed by oral mucosa, gums, etc.** (6,17,18,31,34,77,79,83,94,133,174,182,209,211,216,222,319,335,348, 364,436) The sublingual venal, olfactory, and neural pathways are direct pathways to the brain and CNS bypassing the liver's detox system and appear to represent major pathways of exposure(34) based on the high levels of mercury vapor and methyl mercury found in saliva and oral cavity of those with amalgam. A study at Stockholm Univ.(335) made an effort to determine the respective parts in exposure made by these paths. **It found that the majority of mercury exposure was from elemental vapor, and that the majority of excretion is through feces.** Daily exposure from intraoral air ranged from 20 to 125 ug of mercury vapor, for subjects with number of filling surfaces ranging from 18 to 82. Daily excretion through feces amounted to from 30 to 190 ug of mercury, being more variable than other paths. Other studies had similar findings (6,15,16,18,19,25,31,36,77,79, 80,83,115, 196,386.) Most with several amalgams had daily fecal excretion levels over 50 ug/day.

One study that looked at this estimated a daily average burden of 20 ug from ionized mercury from amalgam fillings absorbed through the lungs(191), while a Norwegian study found the average level in oral air to be 0.8 ug/M3(176). Another study at a Swedish University(335) measured intraoral air mercury levels from fillings of from 20 to 125 ug per day, for persons with from 18 to 82 filling surfaces. Other studies found similar results(83,95), and some individuals have been found to have intraoral air mercury levels above 400 ug/ M3 (319). Most of those whose intraoral air mercury levels were measured exceeded Gov't health guidelines for workplace exposure(2). **Most with several fillings have mercury levels much above Government Health Standards.** The studies also determined that the number of fillings is the most important factor related to mercury level, with age of filling being much less significant(319b).

**2. The daily mercury exposure(measured in saliva and feces) for those with amalgam fillings is on average more than 10 times higher than those without amalgam fillings.**

Documentation: The reference average level of mercury in feces(dry weight) for those tested at Doctors Data Lab with amalgam fillings is .26 milligrams/kilogram, compared to the reference average level for those without amalgam fillings of .02 mg/kg(528). (13 times that of the population w/o amalgam). A Swedish lab that does fecal tests for mercury had similar results(386d).

A study at Stockholm Univ.(335) made an effort to determine the respective parts in known exposure paths. It found that the majority of excretion is through feces, and that the majority of mercury exposure was from elemental vapor. Daily exposure from intraoral air ranged from 20 to 125 micrograms(ug) of mercury vapor, for subjects with number of filling surfaces ranging from 18 to 82. Daily excretion through feces amounted to from 30 to 190 ug of mercury, being more variable than other paths. Other studies had similar findings(6,15,16,18,19,25,31,36,77,79,80,83,115,196, 386,528.) The average level of mercury in feces of those in some populations with amalgam fillings is over 1 ppm and approx. 10 times that of a similar group without fillings (79,80,83,335,386,528,25), with significant numbers of those with several fillings having over 10 parts per million(ppm). Most with several amalgams had daily fecal excretion levels over 50 ug/day. The medical lab test results yield similar results.

A large German study measuring the mercury level in saliva of 20,000 people found that the level of mercury in saliva is proportional to the number of amalgam fillings(199). The level for those with several amalgam fillings(8 or more) was more than 10 times the level of those without amalgam fillings. 10 % had unstimulated mercury saliva levels of over 100 ug/L. Saliva tests for mercury are commonly performed in Europe, and many other studies have been carried out with generally comparable results(292,315,79,9b,335,179,317,352). Another large German study(352) found significantly higher levels than the study summarized here, with some with exposure levels over 1000 ug/day. Three studies that looked at a population with more than 12 fillings found generally higher levels than this study, with average mercury level in unstimulated saliva of 29 ug/L(18), 32.7 ug/L (292c), and 175 ug/day(352). 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 7 micrograms(ug) per day (18,77,83,85,93,138,183,199,211,292,315,335). In a large German study, the median daily exposure for those with fillings through saliva was approx. 10 ug/day, 4% of those with fillings had daily exposure through saliva of over 80 ug/day, and 1% had over 160 ug/day(199). The methods and results of the Tubingen study(199) were similar to those of other German studies(292,315,9, 138, 317,335). Total intake is

proportional to the number and extent of amalgam surfaces, but other factors such as chewing gum, drinking hot liquids, brushing or polishing, and using fluoride toothpaste significantly increase the intake(15,18,28,31,100,134-137,182,183,199,209,211, 292,317,319,348,349,350). Vapor emissions range up to 200 ug/M3 (35) and are much higher after chewing(15,137,319). After chewing, those with amalgams had levels over 50 times higher than those without, and the average level of exposure was 29 ug/day for those with at least 12 occlusal surfaces(18). The saliva and feces of children with amalgams have approximately 10 times the level of mercury as children without(25,315,386), and much higher levels in saliva after chewing.

**3. When amalgam fillings are removed with proper protection and technique, the level of mercury exposure and body burden increase slightly for a few days and then decrease significantly. The level of mercury in saliva and feces usually decline from 80 to 95%, while the level in blood and urine decline between 60 to 85% over the first 6 months.**

Documentation:

Removal of amalgam fillings resulted in a significant reduction in body burden and body waste product load of mercury(75,82,88,89,93,95,115,57). After amalgam filling replacement, levels of mercury in the blood, urine, and feces typically temporarily are increased for a few days, but levels usually decline in blood and urine within 6 months to from 60 to 85% of the original levels(57,79,82,89,196,303). Mercury levels in saliva and feces usually decline between 80 to 95% (79,196,335,386). On average those with 29 amalgam surfaces excreted over 3 times more mercury in urine after DMPS challenge than those with 3 amalgam surfaces, and those with 45 amalgam surfaces more than 6 times as much mercury(12b). The blood and urine mercury load of a person with amalgam fillings is often 5 times that of a similar person without (14,16,17,79,80,82,93,136,138, 303,315,317,318). The average blood level for one large population was 5 ug/l(176). Mercury level in saliva has been found to give much better indication of body levels than blood or urine levels(36).

**4. Mercury vapor from amalgam is the single largest source of systemic mercury intake for persons with amalgam fillings, ranging from 50 to 90 % of total exposure with the average being more than 70% of total exposure. Mercury exposure, as measured in blood, urine, saliva, or feces is directly proportional to the number of amalgam fillings that one has. The level of mercury in the urine or blood of those with amalgam fillings is on average approximately 5 times that of those without fillings.**

Documentation.

The average amalgam filling has approximately 0.5 grams(500,000 ug) of mercury, which is known to vaporize constantly in the mouth due to mercury's negative vapor pressure and galvanic currents induced by mixed metals in an electrolyte, saliva(192,etc). As much as 50% of mercury in fillings has been found to have vaporized after 5 years and 80% by 20 years(182,204). Mercury vapor from amalgam is the single largest source of systemic mercury intake for persons with amalgam fillings, ranging from 50 to 90 % of total exposure. (14,16,17,19,36,57,61,77-83,94,129,130,138,161,167,183, 191,196,211,216,273,292,303,332.), averaging about 80% of total systemic intake.

The blood and urine mercury load of a person with amalgam fillings is often 5 times that of a similar person without.(14,16,17,79,80,82,93,136,138, 303,315,317,318) The average blood level for one large population was 5 ug/l(176). The range of mercury excreted in urine per day by those with amalgams is usually less than 15 micrograms (ug) (6,49,83,138,174,335,etc.), but some patients are much higher(93). A large NIDH study of the U.S. Air Force population(49) with an average of 19.9 amalgam surfaces and range of 0 to 60 surfaces found the average urine level was 3.1 ug/L, with 93% being inorganic mercury . The average in those with amalgam was 4.5 times that of controls and more than the U.S. EPA maximum limit for mercury in drinking water(218). The average level of those with over 49 surfaces was over 8 times that of controls. The same study found that the average blood level was 2.55 ug/L, with 79 % being organic mercury. The total mercury level had a significant correlation to the number of amalgam fillings, with fillings appearing to be responsible for over 75% of total mercury. >From the study results it was found that each 10 amalgam surfaces increased urine mercury by approx. 1 ug/L. A study of mercury species found blood mercury was 89% organic and urine mercury was 87% inorganic (349b), while another study(363) found on average 77% of the mercury in the occipital cortex was inorganic.

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

- (a) blood plasma mercury level (17,22,23,49,79,89,133,211)(usually not as strong as other measures)
- (b) urine mercury level (38,49,57,76,77,79,82,83,134,138,167,176,254,303,332,335)
- © oral air(16,18,100,176,335)

- (d) saliva and oral mucosa(18,30,77,79,117,179,174,199,211,222,292,315,317)
- (e) feces mercury (25,79,80,83,115,117,182,335,386)
- (f) pituitary gland (19,20,25,85,99,273/274)
- (g) brain occipital cortex (14,16,19,25,34,85,211,273,348,366/274)
- (h) renal(kidney) cortex(14,16,19,20,85,254,273,348,366)
- (I) liver(14,19,85,366)
- (j) motor function areas of the brain & CNS: brain stem, cerebellum, rhombencephalon, dorsal root ganglia, and anterior horn motor neurons (48,291,327,329,442,35.)
- (k) fetal and infant liver/brain levels(61,112,186,231,22) related to maternal fillings.

**5. Based on autopsy studies, mercury bioaccumulates in the major body organs in direct proportion to the number of amalgam fillings or in proportion to dental office exposure.**

**Mercury has been found to accumulate in the brain,CNS, and motor neurons; liver; kidneys; heart; hormonal glands; oral mucosa, etc.**

Documentation:

Based on autopsy studies for those with chronic exposure such as amalgam fillings, mercury bioaccumulates directly proportional to the number of amalgam fillings - in the brain/CNS (14,19,85,301,273,274,327,329,348,366), liver and kidneys(14,19,20,85,273,348,366), heart(59,205,266,306,348), pituitary gland (19,20,85,99,273,274, 366) and oral mucosa(30,48,174,182,192,436) with the half life in the brain being over 20 years.

Autopsy studies have found high body accumulation in dental workers, with levels in pituitary gland and thyroid over 10 times controls and levels in renal cortex 7 times controls(99,363,38).

**6. Municipal sewer agencies have measured the levels of mercury in home sewers and sewer plants and found that the main cause of the high levels of mercury found in all U.S. sewer plants is mercury from homes and businesses of those with amalgam fillings, along with mercury from dental office sewers. The levels measured in sewers of homes of those with amalgam implies daily excretion levels in the range of 50 to 100 micrograms for those with amalgam fillings.**

Documentation.

Most U.S. sewer plants have high levels of mercury- with that from amalgam responsible for the majority, as much as 80% of the total in residential sewers and sewer plants(13b).

The total discharge into sewers from dental amalgam at individual homes and businesses is even more than at dental offices, since the average person with amalgam fillings excretes in body waste approx. 100 micrograms per day of mercury(6,7,8,20). This has also been confirmed by medical labs such as Doctors Data Lab in Chicago and Biospectron in Sweden which do thousands of stool tests per year and is consistent with studies measuring levels in residential sewers by municipalities(13b).

In the U.S. this would amount to approximately 7300 kilograms per year into sewers or over 8 tons per year. Thus the amount of mercury being excreted from dental amalgam is more than enough to cause dangerous levels of mercury in fish in most U.S. streams into which sewers empty. According to an EPA study the majority of U.S. sewerage plants cannot meet the new EPA guideline for mercury discharge into waterways that was designed to prevent bioaccumulation in fish and wildlife due to household sewer mercury levels(15,13). Over 3 tons of mercury flows into the Chesapeake Bay annually from sewer plants, with numerous resulting fish consumption advisories for that area and similar for other areas(16). The EPA discharge rule is being reevaluated due to a National Academy of Sciences report of July 2000 that found that even small levels of mercury in fish result in unacceptable risks of birth defects and developmental effects in infants(18). In Florida over 50% of rivers and lakes have warnings to limit fish consumption due to high mercury levels.

**III. Most people with several amalgam fillings have daily mercury exposure more than the U.S. Government(ATSDR/EPA) health guideline for mercury exposure.**

Documentation.

The U.S. ATSDR health standard(MRL) for mercury vapor is 0.2 microgram(ug)/ M3 of air, and the MRL for methyl mercury is 0.3 ug/kg body weight/day(217). For the average adult breathing 20 M3 of air per day, this amounts to an exposure of 4 or 6 ug/day for the 2 elemental mercury standards. The EPA health guideline

for methyl mercury is 0.1 ug/kg body weight per day or 7 ug for the average adult(2), or approx. 14 ug for the ATSDR acute oral toxicity standard. Since mercury is methylized in the body, some of both types are present in the body.

**Most people with amalgam fillings have daily exposure levels exceeding the U.S. ATSDR and EPA health guideline levels (2,36,83,89,183,199,209,217,261,292,335,93, &Part II.1-6)**

Thus from the previous documentation, it is seen that most people with several amalgam fillings have daily exposure to mercury of more than the U.S. Government health guideline for mercury. **The EPA drinking water standard for mercury is 2ppb(125).** The upper level of mercury exposure recommended by the German Commission on Human Biomonitoring is 10 micrograms per liter(ppb) in the blood(39), but adverse effects such as increases in blood pressure and cognitive effects have been documented as low as 1 ug/L(ppb), with impacts higher in low birth weight babies(39).

References(see: [www.home.earthlink.net/~berniew1/amalg6.html](http://www.home.earthlink.net/~berniew1/amalg6.html)) to be supplied

#### **IV. Mechanisms Documented by Which Mercury from Amalgam Dental Fillings and Vaccinations Are a Cause or Major Factor in Over 30 Chronic Health Conditions**

1. **Research including over 1500 peer-reviewed or government studies has been accumulated from the medical literature documenting the mechanism by which mercury causes or is a major factor in over 30 chronic health conditions.** (1a,1b)

2. **Also accumulated are the clinical results of over 30,000 cases of amalgam replacement as followed and documented by doctors with evidence of cure or significant improvement in these chronic conditions.** (1c,1b)

The conditions for which mechanisms of causality are documented and evidence of significant improvement after amalgam replacement include:

(a) **autoimmune problems** such as arthritis, MS, Lou Gehrig's Disease(ALS), Parkinson's/ muscle tremor, Alzheimer's, muscular & joint pain /fibromyalgia, chron's disease, lupus, scleroderma, Chronic Fatigue Syndrome(CFS), endometriosis, diabetes (6,1b)

(b) **immune system conditions** such as allergies asthma, multiple chemical sensitivities, eczema, psoriasis, other skin conditions; cancer(breast, leukemia,etc.), susceptibility to infections, antibiotic resistant infection, sinus problems (7,,2,1b)

© **periodontal diseases** such as gingivitis, oral lichen planus, amalgam tattoos, metal mouth, halitosis, oral keratosis(pre cancer); (9,4,1b)

(d) **cardiovascular conditions** including tachycardia, angina, arteriosclerosis, other heart conditions, hypertension, and other blood conditions (8,1b)

(e) **neurological and mood disorders** including memory disorders, depression, schizophrenia, insomnia, anger, anxiety & mental confusion, neuropathy/paresthesia, tinnitus, dizziness/vertigo, headaches/ migraines, epilepsy, ADD, dyslexia, learning disabilities, hearing loss, etc. (2,1b)

(f) **hormonal problems** such as hypothyroidism, adrenal problems, chronic chills, Hashimoto's Disease, alopecia/hair loss, urinary/ prostate problems, depression, suicidal thoughts (8,1b)

(g) **reproductive problems** such as infertility, reduced sperm counts, PMS, spontaneous abortions, birth defects, developmental disabilities, children with learning disabilities and low IQ, etc. (8,3,1b)

(h) **stomach/digestive problems** including leaky gut, chron's disease, malabsorption of essential minerals and essential fatty acids, blocked cellular enzymatic processes related to the ATPASE energy function and sulfur oxidation, (1b,2)

**There are extensive documented cases (many thousands) where removal of amalgam fillings led to cure or significant improvement of these serious health problems. Over 30,000 such clinical cases are**

compiled in the documentation as followed and compiled by doctors. The over 30,000 cases of cure or significant improvements were not isolated cases of cures; the clinical studies indicated a large majority of most such type cases treated showed significant improvement.

(1)

**Mercury's extreme cytotoxicity and neurotoxicity is a major factor in the neurological conditions,** along with its inhibition of basic enzymatic cellular processes and effects on essential minerals and nutrients in cells. Mercury is also documented to cause imbalances in neurotransmitters related to mood disorders. A direct mechanism involving mercury's inhibition of cellular enzymatic processes by binding with the hydroxyl radical(SH) in amino acids appears to be a major part of the connection to allergic/immune reactive conditions such as autism, schizophrenia, lupus, eczema and psoriasis, scleroderma, and allergies. Immune reactivity to mercury has been documented by immune reactivity tests to be a major factor in many of the autoimmune conditions([www.melisa.org](http://www.melisa.org)). (1b,2)

The over 1500 peer reviewed studies mostly either Government studies or abstracted in the National Library of Medicine([www.nlm.nih.gov/](http://www.nlm.nih.gov/)) document that most people with several amalgam dental fillings get significant daily exposure to mercury that is the **largest source of mercury exposure for most people and often above the Government health guideline for mercury.** The reason for the high exposure levels from amalgam are mercury's negative vapor pressure that means it is constantly vaporizing, along with galvanic electric currents caused by mixed metals in the mouth that drive mercury and other metals into the body. These are easily measured which has been widely documented. (1b,4)

The studies also document that mercury from amalgam or other sources such as fish crosses a woman's placenta readily and accumulates to levels in the fetus at levels usually higher than in the mother. And that mercury in the mother is transferred at significant levels to a breast-fed infant. The fact that children have been exposed to levels of highly toxic mercury thimerosal in vaccinations well beyond Government health guidelines for mercury is also well documented. Studies document that such mercury exposures can cause developmental conditions and disorders such as autism, ADD, learning disabilities, etc. (1,2,3)

The studies also document that due to the high daily exposure from amalgam, people excrete high amounts of mercury into home and office sewers which cause levels in sewer plants to be high enough to contaminate with mercury most of the water bodies they empty into to the extent that fish and wildlife are contaminated with dangerous levels of mercury. Over 20% of the lakes, all Great lakes, 7% of U.S. river miles, and many bays are contaminated to the extent warnings have been issued to not eat the fish. Amalgam is documented to be a major source of mercury in many water bodies. (5,1b)

#### References

(1a) **Common Exposure Levels and Adverse Health Effects from Amalgam Fillings,**  
[www.home.earthlink.net/~berniew1/indexa.html](http://www.home.earthlink.net/~berniew1/indexa.html) (over 1500 Peer Reviewed references)

(1b) [www.home.earthlink.net/~berniew1/amalg6.html](http://www.home.earthlink.net/~berniew1/amalg6.html) and

(1c) Over 30,000 clinical cases of amalgam replacement followed by doctors with  
[www.home.earthlink.net/~berniew1/hgremove.html](http://www.home.earthlink.net/~berniew1/hgremove.html)

(2) **Autism, ADD, Pervasive Developmental Disorders, and Learning Disabilities: the Mercury Connection,**  
[www.home.earthlink.net/~berniew1/indexk.html](http://www.home.earthlink.net/~berniew1/indexk.html)  
(over 150 PR studies)

(3) **Developmental Effects of Mercury on Infants.**  
[www.home.earthlink.net/~berniew1/fetaln.html](http://www.home.earthlink.net/~berniew1/fetaln.html)

(4) **Oral Galvanism: the Battery in Our Mouth,** [www.home.earthlink.net/~berniew1/galv.html](http://www.home.earthlink.net/~berniew1/galv.html)  
(documentation of the mechanisms which cause high mercury exposure levels from amalgam)

(5) **DAMS, The Environmental Effects of Amalgam Affect Everyone;**  
[www.home.earthlink.net/~berniew1/damspr2s.html](http://www.home.earthlink.net/~berniew1/damspr2s.html)  
(high mercury excretion levels of those with amalgam are resulting in high levels of mercury  
(In sewers, rivers, lakes, fish, sewer sludge, landfills(and rain), etc.)

(6) The mercury connection to chronic health conditions(over 1500 peer-reviewed references)  
all: [www.home.earthlink.net/~berniew1/amalg6.html](http://www.home.earthlink.net/~berniew1/amalg6.html) /

Lou Gehrig's Disease(ALS): [www.home.earthlink.net/~berniew1/als.html](http://www.home.earthlink.net/~berniew1/als.html) /

MS/Arthritis: [www.home.earthlink.net/~berniew1/ms.html](http://www.home.earthlink.net/~berniew1/ms.html) /

Chronic Fatigue Syndrome(CFS), Fibromyalgia, Lupus,

[www.home.earthlink.net/~berniew1/cfsfm.html](http://www.home.earthlink.net/~berniew1/cfsfm.html) /

Parkinson's: [www.home.earthlink.net/~berniew1/parknew.html](http://www.home.earthlink.net/~berniew1/parknew.html) /

Alzheimers Disease: [www.home.earthlink.net/~berniew1/alz.html](http://www.home.earthlink.net/~berniew1/alz.html)

7. Immune and Allergy Conditions: [www.home.earthlink.net/~berniew1/immunere.html](http://www.home.earthlink.net/~berniew1/immunere.html)

8. Hormonal Problems and Cardiovascular Problems:

[www.home.earthlink.net/~berniew1/endohg.html](http://www.home.earthlink.net/~berniew1/endohg.html) and

[www.home.earthlink.net/~amalg6.html](http://www.home.earthlink.net/~amalg6.html)

9. Periodontal Disease: [www.home.earthlink.net/~berniew1/periodon.html](http://www.home.earthlink.net/~berniew1/periodon.html)

( gingivitis, bleeding gums, bone loss, mouth sores, oral lesions, pain and discomfort, burning mouth, "metal mouth", chronic sore throat, chronic inflammatory response, lichen planus, trigemeral neuralgia, autoimmune response, oral cancer, etc.)

#### **V. Mercury's Effects on Fetal Development**

**The saliva and feces of children with amalgams have approximately 10 times the level of mercury as children without[140,141], and much higher levels in saliva after chewing.** A group of German children with amalgam fillings had urine mercury level 4 times that of a control group without amalgams[142], and in a Norwegian group with average age 12 there was a significant correlation between urine mercury level and number of amalgam fillings(143). However a larger source of mercury in infants is from the mother's amalgam fillings.

**Many recent studies have found reproductive effects including infertility and developmental effects in the fetus and infants at much lower levels than those having significant effects on adults.** As compared to adults, the fetus and newborns have been found to be much more susceptible to the effects of low levels of mercury exposure due to low body weight with higher food consumption rate per kilogram of body weight, higher gastrointestinal absorption rate, less effective renal excretion, and a less effective blood-brain barrier[33].

**Mercury vapor has been demonstrated to cause rapid transmittal through the placenta to the fetus** [14,15,34-51]. The fetal mercury content after maternal inhalation of mercury vapor was found to be over 20 times that for maternal exposure to an equivalent dose of inorganic mercury[48-50], and levels of mercury in the brain, heart, and major organs have been found to be higher after equal exposure levels to mercury vapor than for the other mercury forms [8,55]. Some developmental and behavioral effects from mercury vapor have been found at levels considerably below that required for similar effects by methyl mercury [10,38,49,56-58]

Based on animal studies using rats, sheep, and monkeys as well as human studies, mercury from amalgam in the blood of pregnant women crosses the placenta and appears in amniotic fluid and fetal blood, liver, and pituitary gland within 2 days of placement [10,14,15, 34-36,43-47,60,54]. **Studies have found a significant correlation between number of amalgam fillings of the mother and the level of mercury in the fetus, infants, and young children** [10,14,15,34-40], and also with the level in mother's milk [10,38-42]. Breast milk has been found to increase the bioavailability of inorganic mercury, which was found to be excreted to milk from blood at a higher level than organic mercury(41,44,61). The main mechanism of transfer was found to be binding to albumin(45). For non-occupationally exposed populations and populations without high fish consumption, these studies found **dental amalgams appear to be the main source of mercury in breast milk and the fetus**[43,44,46,54,61]. U.S. ATSDR staff[62] indicate that under normal circumstances mercury in mother's milk should be under 1.7 ug/L, and 3.5 ug/L appears to be an adequate screening level for health risk. They indicate that there is evidence that contaminated breast milk is a source of potential risk to infants. An Italian study indicates that a commonly used mercury tolerance level for human milk is 4 ppb(43). **It is well documented that people with several amalgam fillings often have higher levels of mercury in the blood than these levels.**

**Mercury is often stored in breast milk and the fetus at much higher levels than that in the mother**

[10,36,38-46,60,61/54]. **Milk from mothers with 7 or more fillings was found to have levels of mercury approximately 10 times that of amalgam free mothers.** The milk sampled ranged from 0.2 to 57 ug/L. In a population of German women, the concentration of mercury in early breast milk ranged from 0.2 to 20.3 ug/L. After 2 months lactation the level had declined and was 0.1 to 11.7 ug/L[64].

**The highest levels of mercury are usually found in the pituitary gland of the fetus which affects development of the endocrine, immune, and reproductive systems.** Mercury has been well documented to be an endocrine system disrupting substance in animals and people, preferentially accumulating in and disrupting function of the pituitary gland[10,12,39,65], hypothalamus, and thyroid gland[12,65-67]; along with disrupting or blocking enzyme production processes[57,68-73], glucose transfer[57], and many hormonal functions[74-79] at very low levels of exposure. The pituitary gland controls many of the body's endocrine system functions and secretes hormones that control most bodily processes, including the immune system and reproductive systems[79]. The hypothalamus regulates body temperature and many metabolic processes.

**Mercury has also been documented to be a reproductive and developmental toxin in humans. Some of mercury's documented hormonal effects at very low levels of exposure include effects on the reproductive system resulting in lowered sperm counts, defective sperm cells, and lowered testosterone levels in males; along with menstrual disturbances, infertility, spontaneous abortions in women, and birth defects.** Studies found that very low levels of exposure to mercury cause genetic/ DNA damage[34,81-88] and inhibits DNA & RNA synthesis[81,85/86]; damages sperm, lowers sperm counts and reduces motility [34,81,88-92,5,6/88,93,95]; causes menstrual disturbances [96,97]; reduces blood's ability to transport oxygen to fetus, and transport of essential amino acids and nutrients including magnesium, zinc and Vit B12 [40,57,71,72,98,99]; depresses enzyme function and isocitric dehydrogenase (ICD) in fetus[92-95,99]; causes reduced iodine uptake, inhibited ATP activity, & hypothyroidism[66]; causes infertility[74-78,89-93,95,100-104/ 88,106], and causes spontaneous abortions and birth defects [36,40,51,66,75,78,79,100,101,104,107-113/106,113,114]. Pregnant women who suffer from hypothyroidism (underactive thyroid) have a four-times greater risk for miscarriage during the second trimester than those who don't, and women with untreated thyroid deficiency were four-times more likely to have a child with a developmental disabilities and lower I.Q.(66)

Reviews of recent studies have found that the incidence of abnormalities of genitourinary abnormalities in human males has increased during the past 50 years, including cryptorchidism and hypospadias[79,81,115]. The incidence of testicular cancer was found to have increased 3 to 4 fold since the 1940s. The reviews also found that studies indicate that sperm quality and quantity have decreased significantly during this period, with an average decrease in sperm density of approximately 40 % since 1940 along with increased sperm abnormalities. Mercury and other toxic metals are among the toxics that have been found in animal studies to have such effects [5-7,40,79,88,95].

**A large cohort study of occupationally exposed women found an increased risk of spontaneous abortion and other pregnancy complications[101].** Women with hormonal problems seeking help at a gynecological clinic in Germany were found to have higher body burdens of heavy metals, including mercury[74,75,78], and women with idiopathic menstrual problems had higher levels of mercury[75,77,96,100]. Women with hormonal related alopecia(hair loss) also had higher mercury levels than controls[78,116,117] and the condition was alleviated by amalgam removal. Most women with very high levels of mercury were infertile, and after clearance of metals many were fertile again[74-78].

The human brain forms and develops over a long period of time compared to other organs, with neuron proliferation and migration continuing in the postnatal period. The blood-brain barrier is not fully developed until the middle of the first year of life. Similarly there is postnatal activity in the development of receptors and transmitter systems as well as in the production of myelin. Many of the toxic substances such as mercury are known to damage the developing brain by interfering with one of these developmental processes, interfering with structural development depending on what is developing at the time of exposure[118-126]. **Mercury and other toxic substances are known to accumulate in endocrine system organs such as the pituitary gland, thyroid, and hypothalamus and to alter hormone levels and endocrine system development during crucial periods of development(10,12,33,41,47-49,79,132).** Such effects are usually permanent and affect the individual throughout their life. Some of the relatively subtle effects that have been found to occur such as small decreases in IQ, attention span, and connections to delinquency and violence, if they occur in relatively large numbers over a lifetime can have potentially serious consequences for individuals as well as for society[118,119].

**Animal studies of developmental effects of mercury on the brain have found significant effects at extremely low exposure levels, levels commonly seen in those with amalgam fillings or in dental staff working with amalgam.** One study[120] found mercury vapor affected NGF concentration, RNA, and choline acetyltransferase in rat's forebrain at between 4 and 11 parts per billion(ppb) tissue concentration. Another study[123] found general toxicity effects at 1 micromole(uM) levels in immature cell cultures, increased immunoreactivity for glial fibrillary protein at 1 nanomole (0.2 ppb) concentration, and microglial response at even lower levels. Other animal studies on rodents and monkeys have found brain cellular migration disturbances, behavioral changes, along with reduced learning and adaption capacity after low levels of mercury vapor or methylmercury exposure [49-53,58,128-130/92,124-126]. The exposure levels in some of these studies are seen in the fetus and newborn babies of mother's with amalgam fillings or who had work involving amalgam during pregnancy[14,15].

**Epidemiological studies have found that human embryos are also highly susceptible to brain damage from prenatal exposure to mercury**[120,121,124-126]. Prenatal/early postnatal exposure to mercury affects level of nerve growth factor(NGF) in the brain and causes imbalances in development of the brain [40,120-123,130,94,124-126]. Exposure of developing neuroblastoma cells to sub-cytotoxic doses of mercuric oxide resulted in lower levels of neurofilament proteins than unexposed cells[126]. Mercury vapor exposure causes impaired cell proliferation in the brain and organs, resulting in reduced volume for cerebellum and organs and subtle deficiencies[40,120-23]. Neurotoxicity as a result of mercury exposure has also been found to be due to the inducing of reactive oxygen species such as superoxide ion, hydrogen peroxide, and hydroxyl radical causing enhanced lipid peroxidation, DNA damage, and altered calcium and sulfhydryl homeostasis[120,121,131].

**Several studies found that mercury along with other toxic metals cause learning disabilities and impairment, and reduction in IQ**[40,58,129,132-139]. 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 [36,40,100-102]. Exposure to mercury and 4 other heavy metals measured by hair tests in a study of school children accounted for 23% of the variation in test scores for reading, spelling and visual motor skills[135]. A combined hair level score for mercury, lead, arsenic, cadmium and aluminum was found to be significantly related to increased scores on the WPBIC subscales measuring acting-out, disturbed peer relations, immaturity, and the total score[133]. Similar tests in the California juvenile justice system have found significant relations to classroom achievement, juvenile delinquency, and juvenile delinquency.

**Studies have found much higher levels of mercury and copper in infants whose mother's were treated with amalgam during pregnancy**[37], as well as children with congenital hearing deficiencies[63]. **Most researchers in this field advise that fertile women should not be exposed to vapor levels above government health guidelines or have amalgams placed or removed during pregnancy** [10-12,15,16,24,27,39,40,65,74,103,144,145]; the U.S. ATSDR mercury health MRL is 0.2 ug/M<sup>3</sup> [32]. **Many governments of developed countries have bans or warnings restricting use of amalgam by women of child-bearing age.** These include Canada, Sweden, Germany, Norway, Austria, Great Britain, France, Australia, New Zealand, and Japan.

References [www.home.earthlink.net/~berniew1/fetaln.html](http://www.home.earthlink.net/~berniew1/fetaln.html)

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

**For the week following amalgam removal, body mercury levels increase significantly, depending on protective measures taken, but within 2 weeks levels fall significantly.**(82,89) Chronic conditions can worsen temporarily, but usually improve if adequate precautions are taken to reduce exposure during removal. Removal of amalgam fillings resulted in a significant reduction in body burden and body waste product load of mercury(75,82,88,89,93,95,115). **Mercury levels in saliva and feces usually decline between 80 to 95%** (79,196,335,386). **Total reduction in mercury levels in blood and urine is usually over 60% and often over 80% within a few months**(79,82,89,93,115,57). On average those with 29 amalgam surfaces excreted over 3 times more mercury in urine after DMPS challenge than those with 3 amalgam surfaces, and those with 45 amalgam surfaces more than 6 times as much mercury(12b).

For the following case studies of amalgam replacement, some clinics primarily replaced amalgam fillings(usually also with any metal crowns over amalgam) using patient protective measures and supportive supplements, whereas some clinics do something comparable to Hal Huggins total dental revision where in addition to amalgam replacement, patients gold or nickel crowns over amalgam are replaced by biocompatible

alternatives, root canals extracted and cavitations checked for and cleaned. **There are extensive documented cases (many thousands) where removal of amalgam fillings led to cure or significant improvement of serious health problems such as periodontal diseases (35,40,46,57,60,75,78,82,86,87,90,94,95,100,101,115, 133,168, 212,222,233,271, 313,317, 321,322,376,525), oral keratosis(pre cancer)(87,251), immune system/ autoimmune problems (8,35,60,222,270,271,313,323,375,91,212,229,291,452,470,485,523), allergies(8,26,35,40,46,94,95,97,165,212,222,228,229,233,271,317,322,349,376,469), asthma(8,75,97,222,228,271,322),chronic headaches/migraines(5,34,35,95,212,222,229,233, 271, 317,322,349,354,115,368,376,440,453,523), multiple chemical sensitivities (26,35,95,222,229,232,233,115,313,375), epilepsy (5,35,309,229), tachycardia and heart problems (205,35,59,94,115, 212,222,232,233,271,306,310,212), blood conditions (212,222,232,233,271,470,523,35,95), chron's disease(222,229,469,485), stomach problems (35,95,212,222,228,229,233,271,317,322,440,469,35), lupus(12,35,113,222,229,233,323), dizziness/vertigo(40,95,212,222,271,322,376,453) joint pain/ arthritis(35,95,103,212, 222,271, 313,322,358,469,523), Multiple Sclerosis(94,95,102,170,212,222,271,291,302,469,34,35,229, 485,523), ALS(97,229,423,405,469,470,485,35), Parkinson's/ muscle tremor (222,248,229,271,469,212,94,98,35), Alzheimer's(204,35), Chronic Fatigue Syndrome (8,35,60,88,212,293,229,222,232,233,271,313,317,323,369,375,376,440,469,470,523), muscular/joint pain/Fibromyalgia (35,222,293,317,322,369,440,469,470,523,527,94), infertility(9,35,38, 229,367), endometriosis (229,35,38), memory disorders (35,94,212,222,440,453), schizophrenia (294,34,35), depression (94,107,222,271,294,212,229,233,285e,317,322, 376,453,465,485,523,35,40), insomnia(35,94,212,222,271,317,322,376), anger(212,233,102,35), anxiety & mental confusion (94,212,222, 229,233,271,317,322,440,453,35,57), susceptibility to infections (35,40,222,251,317,349, 350,469,470), antibiotic resistant infection(251), cancer(breast,etc./leukemia) (35,38,94,180,469,486), neuropathy/paresthesia (35,94,212,222,322), alopecia/hair loss (40,187,271,317,322,349), sinus problems (35,40,94, 222,271,322), tinnitus(35,94,222,271,349,376), chronic eye conditions: inflammation/iritis/ astigmatism/myopia /cataracts/macula degeneration (35,222,271,322,440), vision disturbances(35,212,271,322), eczema and psoriasis (168b,323,385,375, 408,459,94,212,222,271,317,341,376), autoimmune thyroiditis(382,91), skin conditions (212,222), urinary/prostrate problems(212,222), hearing loss(102,35), candida(26,35,404,etc.), PMS(35,6,etc.) diabetes(35,etc.), etc. The above over 30,000 cases of cure or significant improvements were not isolated cases of cures; the clinical studies indicated a large majority of most such type cases treated showed significant improvement. Details are available and case histories. Of the above cited references,102 are peer-reviewed studies, 21 are books dealing with treatment of mercury toxicity(most including documentation and references), 8 are medical clinic web site reports, 8 are in medical/nutritional publications, 5 are Conference papers, 3 are government publications, two are newspaper or TV documentaries.**

For example, one of the clinics(95) replacing amalgams in a large number of patients with chronic conditions had **full recovery or significant improvement: in over 90% of cases for: metallic taste, tender teeth, bad breath, and mouth sores; in over 80% of cases for: depression, irrational fear, head aches/migraines, irritability, dizziness, insomnia, bleeding gums, throat irritation, nasal congestion or discharge, muscle tremor, and leg cramps;**

**in over 70% of cases for: bloating or intestinal cramps, skin reactions, sciatic pain, chest pain, poor memory, urinary disorders, fatigue, poor concentration/ADD, watery eyes; in over 60% of cases for: allergies, constipation, muscle fatigue, cold hands/feet, heart problems.** A Jerome meter was used to measure mercury vapor level in the mouth, and the average was 54.6 micrograms mercury per cubic meter of air, far above the Government health guideline for mercury(217) which is 0.2 ug/M3.

Some of the above cases used chemical or natural chelation to reduce accumulated mercury body burden in addition to amalgam replacement. Some clinics using DMPS for chelation reported over 80% with chronic health problems were cured or significantly improved(12,222,271,359). Other clinics reported similar success. **But the recovery rate of those using dentists with special equipment and training in protecting the patient reported much higher success rates than those with standard training and equipment, 97% versus 37 to 88%(435).** The Huggins TDR protocol includes testing teeth with metal for level of galvanic current caused by the mixed metals, and removal of the teeth with highest negative galvanic current first(35). This has been found to improve recovery rate for chronic conditions like epilepsy and autoimmune conditions. Metals are being pushed into the body from negatively charged metal dental work with saliva as electrolyte and the highest charged teeth lose the most metal to the body(35).

Clinical studies have found that patch testing is not a good predictor of success of amalgam removal, as a high percentage of those testing negative also recovered from chronic conditions after replacement of

fillings(86,87,168,etc.).

The Huggins Clinic using TDR has successfully treated over a thousand patients with chronic autoimmune conditions like MS, Lupus, ALS, AD, diabetes, etc.(35), including himself with the population of over 600(approx. 85%) who experienced significant improvement in MS. In a large German study of MS patients after amalgam revision, extraction resulted in 85% recovery rate versus only 16% for filling replacement alone (222,302). Other cases have found that recovery from serious autoimmune diseases, dementia, or cancer may require more aggressive mercury removal techniques than simple filling replacement due to body burden. This appears to be due to migration of mercury into roots & gums that is not eliminated by simple filling replacement. That such mercury(and similarly bacteria) in the teeth and gums have direct routes to the brain and CNS has been documented by several medical studies(34,325,etc.).

Among those with chronic immune system problems with related immune antibodies, the types showing the highest level of antibody reductions after amalgam removal include glomerular basal membrane, thyroglobulin, and microsomal thyroid antigens(91). TDR and other measures used in metals detox have been found to increase T-cells and immune function in AIDS patients(35).

Swedish researchers have developed a sophisticated test for immune/autoimmune reactions that has proved successful in diagnosing and treating environmentally caused diseases such as lichen planus, CFS,MS, etc. related to mercury and other immunotoxics(60,313,375,etc.).

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(212,282). For example 89% of those reporting allergies had significant improvements or total elimination; extrapolated to U.S. population this would represent over 17 million people who would benefit regarding allergies alone.

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