

Amalgam-Related Illness Frequently Asked Questions (FAQ)

What is Amalgam-Related Illness? A true disease or not?

No one knows.

However, *we know that*:

- dental amalgam fillings consists of 50% mercury,
- mercury leaks from the fillings,
- mercury is highly toxic and,
- low chronic mercury intoxication can give rise to symptoms as; anxiety, irritability, fatigue, outbursts of temper, stress intolerance, decreased simultaneous capacity, loss of self-confidence, indecision, headache, depression, metallic taste etc...

But *we do not know*:

- if the amount of mercury released from dental amalgam is enough to cause illness, even in the most exposed or the most sensitive minority of the amalgam-bearing population.

This paper answers some of the questions in the field.

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(Se section 9 of the FAQ for further clarification)

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1 INTRODUCTION

There has been concern and debate about potential / possible (non-allergic-) negative health effects from dental amalgam-fillings. At least several thousand scientific reports and discussion articles in the field of mercury / biology / (health) and several hundred about amalgam / biology / (health) have been produced. The following seems to be consensus (consensus need NOT to be the final truth, but rather what is non-controversial) at present:

- If you do not have any illness / symptoms or other reasons to suspect that you have or will get problems from your amalgam-fillings you are not recommended to have your amalgam-fillings exchanged (NIH 1992) (because of C-G in section 5.2). It seems as if the great majority of the population belongs to this group.
- The question which material to choose the next time an amalgam-filling needs to be replaced or when there is need for a new filling depends on your own decisions and what the dentist find possible / recommendable in that specific tooth cavity. Not one single filling material is best in every situation / from every point of view and no filling material is bio-compatibility-tested the same way medical drugs are. Do you want the cheapest filling, the one lasting longest time, the most aesthetic, the most tooth conservative, the one you / your dentist believe is most biocompatible...? You and your dentist will have to come to an agreement in this choice.
- If you have allergic and / or local oral symptoms from your amalgam-fillings, diagnosed by a physician and / (or) a dentist, it is usually recommended that you exchange these amalgam-fillings for a material you can tolerate. A small minority of the population seems to belong to this group.
- If you have an illness / a multi-symptomatic syndrome and suspect that this is (at least partly) because of your dental amalgam-fillings, you should know that it is an ongoing debate whether such a thing as a (non-allergic-) amalgam-related illness exists or not. Contradictory opinions (see for example: Lichtenberg 1993, Lindberg 1994), both claiming to be the truth, are expressed. Meanwhile science has not (yet) found a definite answer to this question (DHHS 1993 pp 3-4 and III-29, WHO 1991 p 100-102). SIFO (1993) reports that about 4 percent of the Swedish adult population claims to have/had or believes that they have/had negative health effects from their dental amalgam fillings.
- The use of amalgam as a dental filling material is expected to decrease, at least in western world countries and maybe even banned in some countries. These are some of the (proposed) reasons to why:
 - concern about the environmental mercury-pollution
 - development and improvement of different tooth-coloured dental filling materials (DHHS 1993).
 - the non-aesthetic appearance of amalgam.
 - when untreated carious lesions needs to be treated by filling therapy, the preparation of a cavity for insertion of an amalgam-filling often means loss of more healthy tooth-substance than if composite or glass ionomer cement were to be used instead (DHHS 1993 pages I - 17 and I - 21).
 - at least in USA (DHHS 1993, NIH 1992) and Sweden: a decreased caries frequency.
 - amalgam dental fillings leak mercury to such an extent that it is the biggest source of mercury (WHO 1991), on a group level, in the population and is therefore, from a toxicological point of view, an unsuitable / non-desirable dental filling material, even though it has yet to be proven that this mercury-leakage is harmful in other than individuals allergic to mercury / amalgam.
 - the concern about the safety / lack of safety that some / many patients feel. SIFO (1993) reports that about 30 percent of the Swedish adult population have thought of, started or completed amalgam-removal, and that two thirds of the adult Swedish population believes that it is a disadvantage to have ones teeth restored with amalgam when there is need for an restoration. Further on, over

43 percent of the Swedish adult population reported that they thought dental restorations with amalgam should be banned now and an additional 33 % that it should be banned within a five-year period (SIFO 1993)
And indeed, the use of amalgam-fillings is decreasing in USA (DHHS 1993, NIH 1992), Sweden and possibly several other countries too.

BUT

As science can not tell for sure, what should an individual do, who has: multiple symptoms, of which many have been described in mercury poisoning, been thoroughly examined, for all of his / her, symptoms by physicians (and dentists) who did not find any (untreated) differential-diagnose, connection in time between amalgam-work and symptoms, been (fairly) convinced that she / he has an amalgam-related illness?

If such an individual wants to try to exchange his / here amalgam-fillings because he / she finds it possible / probable that he / she has a (non-allergic-) amalgam-related illness, then it seems advisable to study at least what:

- pro-amalgamists say,
- anti-amalgamists say,
- dentists / physicians and their organisations say,
- health authorities say

and then to try to find something that all parties recommend or at least accept as a functional / non-harmful solution. To read the scientific literature in the field is time-consuming.

2 SYMPTOMS

2.1 Symptoms in chronic inorganic Hg-intoxication

The heavy, mostly occupational, chronic inorganic mercury intoxication has been described as having a triad of symptoms:

- Tremor (or more wide: neurological symptoms)
- Gingivitis / stomatitis (or more wide: local oral symptoms)
- Erethismus (or more wide: psychiatric symptoms)

Tremor and gingivitis are not always present and usually not in milder forms. Tremor can cause alteration of the handwriting. The tremor is usually an intentional tremor. Gingivitis is an inflammation of the gingiva (gum).

The Erethismus (from Greek; excite) is a pathologically increased excitability. Erethism is usually the first symptom to develop. It goes along with some or many of the following symptoms:

- Irritability
- outbursts of temper
- stress intolerance
- decreased simultaneous capacity
- increased sensitivity to sounds
- increased sensitivity to light
- resentment of criticism
- loss of self-confidence
- timidity
- excessive shyness
- embarrassment with insufficient reason
- self-consciousness
- anxiety
- indecision
- insomnia
- vivid dreams
- lack of concentration
- memory loss
- depression
- fatigue

all these together can cause a complete change of personality.

The memory loss could be disabling:

“memory loss such that young mothers would forget to retrieve children from baby-sitters on the way home from work... Non-verbal memory tested by facial recognition was no better than chance” (Vroom 1972).

Other symptoms may include: headache, unsteady gait, numbness and pain in the extremities, muscular weakness, paraesthesias, drowsiness, slurring of words, slight stammering, difficulty in pronunciation of words, oedema, metallic taste, loosened teeth, increased salivation, loss of weight, hair loss, nausea, constipation, diarrhoea, other gastrointestinal disturbances, difficulty in breathing...

(Buckell 1946, Elihu 1982, Mantyla 1976, McNerney 1979, Ronnback 1992, WHO 1991, Vroom 1972).

Depending on what reports / journals / books you read, you may find even other symptoms described (for example visual disturbances (Smith 1978) and loss of motor control (Smith 1978)).

2.1.1 Symptoms are typically non-specific

“The symptoms of mercury poisoning from chronic inhalation develop gradually and thus may be difficult to notice. With the exception of tremor, the symptoms may be ignored by the victim or attributed to other causes” (McNerney 1979).

“it is impossible to distinguish early erethism from shyness or anxiety neurosis” (Buckell 1946).

“The effects of inorganic mercury on the nervous system are non-specific in that they can be induced by a wide range of mechanisms” (NIH 1992)

2.1.2 No obligatory symptom exists

No specific (or non-specific) symptom has to be present in order to diagnose a Hg-intoxication.

2.1.3 A multi-symptomatic appearance is normal

The Hg-intoxicated patient is not hypochondriac, it **is** a Hg-feature to cause a multi-symptomatic illness. One could even say that if a person only has one symptom it is not likely to be mercury-related.

2.2 Symptoms of acute inorganic Hg-intoxication

“Acute inhalation exposure to mercury vapour may be followed by chest pains, dyspnoea, coughing, haemoptysis, and sometimes interstitial pneumonitis leading to death... Subacute exposure has given rise to psychotic reactions characterized by delirium, hallucinations, and suicidal tendency” (WHO 1991).

(Haemoptysis = coughing up blood from the lower respiratory tract.)

2.3 Symptoms of Acrodynia

Acrodynia (acro- Latin for: tip / peak, -dynia Greek for pain) even named Pink Disease is a form of chronic Hg-intoxication. The names Acrodynia / Pink Disease point in the direction of something specific and almost obligatory in this form of Hg-intoxication; pink peeling skin and extreme pain at / in distal extremities. A profuse sweating is a common symptom. Other symptoms can be: low-grade intermittent fever as well as hypertonia and tachycardia. Any of the symptoms described in chronic mercury intoxication above (see section 2.1) can be present. It seems to mainly affect younger children, but can affect adults as well. High urine mercury excretion is almost always present, however Cloarec (1995) reported normal urinary mercury levels in a 3 year old child with acrodynia and von Mühlendahl (1990) reported another case of acrodynia with normal urinary mercury levels (6.9 ug Hg / l), in a 20 month old girl. No simple dose-effect-connection in Acrodynia has been established. Only a minority of those exposed to mercury from different mercury-containing medicaments, as teething powder, got affected - a fact that made it hard to track down its causation. It was described 1914 (or even earlier), but not until 1948 was it suggested to be caused by chronic mercury poisoning (Dathan 1965).

(Aronow 1990, WHO 1991)

2.4 Symptoms in suspected amalgam-related illness

As in a Hg-intoxication, the multi-symptomatic picture is the main characteristic in suspected (non-allergic-) amalgam-related illness.

3 IS IT POSSIBLE THAT DENTAL AMALGAM CAN CAUSE THESE SYMPTOMS?

3.1 Are we exposed to toxic levels of mercury from our amalgam fillings?

Dental amalgam consists of approximately 50% (inorganic) mercury (by weight) (DHHS 1993 p I - 2). Besides mercury the amalgam usually consists of silver, tin, copper and sometimes zinc, palladium, or indium (DHHS 1993 p I - 2)...

Mercury **is** highly toxic. Whether or not mercury or any other specific (toxic) metal will cause toxic and / or immunological reactions depends upon a combination of at least:

- the absorbed dose (NIH 1992)
- the genetically determined individual sensitivity (NIH 1992 page 142)
- other factors as:
 - age of the individual (NIH 1992)
 - body weight
 - nutritional status (NIH 1992)
 - additional / synergistic effects of exposure to other heavy metals
 - alcohol consumption (NIH 1992)
 - existence of pre-existing diseases (NIH 1992) for example acatalasia
 - duration of exposition (NIH 1992) including foetal exposure (NIH 1992)
 - exposure route (NIH 1992)
 - chemical state of the metal (vapour, metallic, salts, organic)

Allergic and / or autoimmune reactions to metals, however, do not need to follow the same dose-dependency as that seen in toxic reactions, in fact we know very little about the doses needed in order to give allergic or autoimmune reactions in susceptible humans.

Mercury **is** released from your amalgam-fillings (Bjorkman 1992, Gay 1979, Langworth 1988, Skare 1994, WHO 1991...) and is taken up by your body (Molin 1990, Nylander 1987, Skare 1990, Skare 1994, Weiner 1993, WHO 1991...).

However, it seems that somewhere around 5-200 times (see section 7.2) higher levels of absorbed Hg-dose, than those people absorb from amalgam-fillings on a group level, are required to produce adverse health effects (on a group level) in individuals occupationally exposed to inorganic mercury. This dose-gap points strongly in the direction that the majority of the population would not be affected by mercury from their amalgam-fillings. But IF there is a minority (for example 1-3%) of the population that is substantially more (non-allergic-) sensitive to mercury / amalgam than the rest of the population there could well be a relation between amalgam-fillings and a multi-symptomatic illness in such a minority, the question is however scientifically unclear. A small minority of the (non-occupationally mercury exposed) amalgam-bearing population, has raised mercury levels from their amalgam fillings (see section 7.3), could (some of) these individuals get symptoms because of raised mercury levels rather than raised sensitivity to mercury?

3.2 Studies in individuals with suspected (non-allergic-) amalgam-related illness

3.2.1 Do they have higher mercury levels?

A small fraction of the population with suspected (non-allergic-) amalgam-related illness as well as apparently healthy people has been reported to have rather high mercury levels in some body-fluids. However, individuals with suspected

(non-allergic-) amalgam-related illness have, on a group level, not shown to have significantly higher mercury levels in their blood-plasma (Berglund 1996, Molin 1987, Molin 1995) / whole blood / erythrocytes (Berglund 1996, Molin 1995) / urine (Aronsson 1989, Berglund 1996, Molin 1995) / intra-oral air (Aronsson 1989, Berglund 1996, Fredin 1988) than healthy people with the same amount of amalgam. So it seems that if there is a (non-allergic-) amalgam-related illness in individuals suspecting they have such an illness, it is, on a group level, based upon increased (non-allergic-) sensitivity towards mercury / amalgam rather than higher mercury levels in these body fluids compared with the general population. This does not exclude that there could be a sub-minority among people with suspected amalgam-related illness that has an illness more because of raised mercury-levels than raised sensitivity to mercury. And indeed, there have been reports of cases where raised mercury levels from, as it seems, amalgam fillings is highly suspected to be the cause of illness (Barregard 1995, Langworth 1996, Taskinen 1989).

3.2.2 Provocation with Hg / amalgam in these patients.

Marcusson (1996), in a double-blinded study, patch-tested (with mercury or placebo) a selected group of patients who had earlier reported symptom-increase in conjunction with drilling out of old amalgam fillings. Marcusson reported that the symptoms increased after patch testing with phenyl mercuric acetate (but not significantly with metallic mercury) compared to placebo. As the calculated mercury uptake from a patch-testing (4-10 ug, Marcusson 1996) is about the same as one days uptake of mercury from amalgam (3-17 ug, WHO 1991), a non-allergic systemic reaction to such a patch-test can be seen upon as a sign of a extreme individual non-allergic sensitivity to mercury.

Before jumping to any conclusions, one would have to see the scientific societies response to this article and a reproduction of the study by another research group. Being, as far as I know, the only publicised double-blinded provocation test in this patient-group. I think it has, at least, a value as a stimuli for further research in the area.

3.2.3 Did these individuals get a symptom reduction after amalgam removal?

Reports stating that groups of people, suspecting that they have a (non-allergic-) amalgam-related illness, have reduced their symptoms, by up to 80%, after removing their amalgam-fillings have been presented (Lichtenberg 1993, Lindqvist 1996, Sibling 1990). Also presented are case-reports of people regaining their health after amalgam-removal (Barregard 1995, Godfrey 1990, Langworth 1996, Redhe 1994). It is not possible to definitely distinguish between a ceased poisoning, a placebo-effect, spontaneous recovery or biases due to the subjects potential desire to have his own view on the causation of his illness confirmed or due to his desire to please the investigator.

Berglund (1995) has reviewed the case-reports of adverse effects to amalgam, available in the literature, and found that:

“Removal of amalgam was the common measure that led to improvement or cure”

In several countries there are patient organisations (see section 10.6) with members convinced that they have achieved a symptom reduction after amalgam removal.

Twelve months after a complete amalgam-removal the mercury levels in plasma and urine are reduced to about 50 % (Molin 1990) and 25 % (Begerow 1994, Molin 1990, Molin 1995) respectively of the levels that were present before the amalgam-removal.

3.2.4 Has it been shown that the cause of the illnesses of these individuals were other than amalgam?

There are reports suggesting that the amalgam-related illness has nothing to do with mercury or anything else in the filling material, but it is an

“environmental somatization syndrome (ESS)” (Gothe 1995) or

*“such patients need... to address the core problems of their lives”(Bergman 1992)
or*

“They have all had an early psychological disturbance... Most of them find it difficult to express in words what they feel, and react instead with somatic symptoms to the mental stress that they experience. The illness they then develop is the one “offered” to them. In these cases it became amalgam illness” (Lindberg 1994).

These reports point out the theoretical possibility of causes to illness not related to amalgam in these individuals, but do not, in any way, prove that this is a fact.

It has been reported that somatization, as measured by the Minnesota Personality Inventory, has been found in 4 of 9 Hg-intoxicated individuals (Vroom 1972). Thereby somatization can be looked upon as a feature of Hg-intoxication. This would mean that the presence of somatization is not enough to exclude a Hg-intoxication as the cause of a person's symptom.

It could be that (some) people who are convinced they have an amalgam-related illness really do have other causes to their symptoms, it just hasn't been proven. Also it is not impossible that a patient develops parallel symptoms from psychological, amalgam-related and other causes.

Some doctors do not believe in amalgam-related illness but would rather recommend psychological therapy / psychiatric treatment / medical treatment / odontological treatment (other than amalgam removal).

3.3 Epidemiological comparisons between individuals with different amounts of amalgam

There are epidemiological studies that found that groups of individuals with few or no amalgam-fillings were healthier than groups of individuals that had (more) amalgam-fillings (Kampe 1986, Sibley 1990b, Sibley 1994). Contrary to this there are studies that failed to show this (Ahlqvist 1988, Saxe 1995). Because of methodological problems they can not, alone or together, conclusively answer the question if there is a minority of the population that has or hasn't got a (non-allergic-) amalgam related illness. Ahlqvist's report (1988), however, seems to give additional support to the conclusion (see section 3.1) that a majority or even a big minority (for example over 10-30 %) of the general amalgam-bearing population is probably not negatively health effected from their dental amalgam fillings.

Among the methodological problems, that these studies are afflicted with, are:

- all these reports had **SELECTED GROUPS** because belonging to a non-(few)-amalgam-bearing or high number-amalgam group sub-populations has reasons (for example: depression -> antidepressants -> lower salivary flow -> more caries -> more amalgam... or asthma -> medicine -> changed oral microflora -> increased caries risk -> individual knows this and overcompensates for this -> less caries -> fewer amalgam fillings... or losing teeth -> fewer amalgam fillings). So which came first? Socio-economic group belonging, illness/health, (dys-) function, tooth loss... which gave rise to different amount of amalgam fillings or the amalgam fillings which gave rise to changed socio-economic group, illness/health, (dys-) function, tooth loss...? Correlation / lack of correlation does not prove a true effect / no effect, it only proves a correlation / no correlation. The mechanism can not easily be determined as there are more than one variable (amalgam per se and all the variables that makes individuals belong to a non (low)- or high number-amalgam group).
- some reports had an **EXTRA MUCH SELECTED PATIENT-MATERIAL** (Sibley 1990b), (Sibley 1994 - local newspaper advertisements for people with no amalgam and for people with at least 10 amalgam-fillings), (Ahlqvist 1988; a major (the main?) reason why the group with 0-4 amalgam-fillings had only a few amalgam-fillings was that they had lost their teeth and there were no information available about how long ago they lost their teeth or how many amalgam-fillings

they had before losing their teeth. Also the age range was limited to 38-72 years old, women only), (Ahlqwist 1988; Invited to the study were 1827 individuals but only about 984 remains as the base for Fig 1-2 and table 2 and a maximum of 1158 for table 3-4 in this study = participants, this participation rate (approx. 54% and 63% respectively - the higher participation rate for table 3-4 is achieved because here individuals without any own teeth are included) is not high enough to exclude effects in a minority of the population, there could have been a selection, of eventual individuals having an adverse reaction to amalgam, into the non-participants group). (Ahlqwist 1988, Saxe 1995; there is a hypothetical possibility that (some) individuals who had suspected an amalgam-related illness could have removed their amalgam-fillings, thereby left the group of amalgam-bearers with many amalgam fillings. No information if the study-objects had done so was presented.), (Saxe 1995; Women only, age range 75-102 years).

- **INSUFFICIENT SENSITIVITY:** the number of participants in the non(low)-amalgam group were small (Ahlqwist 1988; 193 individuals, Saxe 1995; 22 individuals) -> hard / impossible to detect an effect that would only affect a small minority (for example 1-3%) of the high number amalgam group, especially since the symptoms of Hg-intoxication are unspecific and very usual in the common population. Ahlqwist (1988) used the prevalence of the symptoms rather than the severity of the symptoms, the question was "Have you had any of the following symptoms during the last three months".
- one of these reports had **NO UNEXPOSED CONTROL-GROUP** (Ahlqwist 1988 compared a 0-4 with a >20 number of amalgam-fillings group)

4 DO I HAVE A (NON-ALLERGIC-) AMALGAM-RELATED ILLNESS?

4.1 No approved diagnostic tests exists

As stated above (see sections 3.1-3.2.1): if there is a (non-allergic-) amalgam-related illness, it seems, at least on a group level in people who suspect they have such a disease, to be based upon an increased individual (non-allergic-) sensitivity towards mercury / amalgam rather than raised mercury in certain body-fluids. And there are no commonly approved ways of testing this potential (non-allergic-) over-sensitivity (other than provocation - see below).

If you, however, suspect that you have raised mercury exposure you can monitor, roughly, the ongoing exposure. The diagnosis of (non-allergic-) amalgam-related illness will have to be a probability diagnosis based upon your history, your symptoms, other findings (not common) and of course exclusion of other diseases.

4.2 You can't determine Hg-levels in your brain / CNS

It is not possible to determine Hg-levels in brains / Central Nervous System (CNS) of living, non-occupationally exposed, individuals.

However you can measure the mercury levels in body-fluids, faeces and hair. After chronic inorganic mercury exposure mercury half-time (T_{1/2}) for part of the Hg in the brain is years (Berlin in: Friberg 1986 page 399), while for body fluids, faeces and hair the T_{1/2} are weeks-months. Therefore there are no way that you can determine accumulated exposure, exposure that has ceased months / years ago or mercury levels in brain, by measuring Hg in body fluids, faeces or hair.

The total (that is: inorganic and organic) mercury levels in urine and blood-plasma or inorganic mercury in whole blood will, however, give you a rough estimation of ongoing (last days-months) inorganic mercury exposure..

The total mercury levels in whole blood and hair will give you a rough measure of ongoing exposure to organic mercury (as methylmercury from fish). The clinical usefulness of measuring mercury levels in faeces as well as in liquor cerebro-spinalis depends upon the possibility of interpreting these values, however, not many scientific studies have been published regarding mercury in faeces and liquor cerebro-spinalis.

Half-time (T_{1/2}); the time it takes before a (mercury-) level has decreased to half.

Three quotations about this follows here:

..“No relation between current U-Hg and previous occupational exposure to Hg was found among subjects in whom exposure had ceased more than one year before the study” (Ellingsen 1993).

“Mercury levels in urine and blood can be used as indicators of exposure provided that the exposure is recent and relatively constant, is long term, and is evaluated on a group basis... interference from methylmercury exposure can make it difficult to evaluate exposure to low concentrations of inorganic mercury by means of blood analysis. A way to overcome the problems is to analyse mercury in plasma or analyse both inorganic mercury and methylmercury. The problem of interference from methylmercury is much smaller when analysing urine, as methylmercury is excreted in the urine to only a very limited extent” (WHO 1991 p19).

“Mercury concentrations in blood and urine are influenced by recent exposure and the body burden of mercury from earlier exposure. The relative contribution of these two parameters for determining levels of mercury in blood and urine is still

poorly understood. The level of mercury in urine is also affected by the physiological variation in metabolism” (Friberg 1986)

4.3 Exclude other illnesses

See your physician for a medical check up. He / she might find something else than Hg-intoxication that could be treated and could explain part of or all of your symptom flora.

For example hypo- / hyperthyreos, Sjogrens syndrome... can mimic Hg-intoxication. Another question is if these and other diseases could be caused or aggravated by mercury / amalgam.

Your dentist could maybe find some treatable tempo-mandibular disorder... causing headache...

4.4 Connections in exposure over time vs. symptoms

Write down a life-graph with its ups and downs (symptoms), then get your hands on all your dental journals. Then compare; if there is a connection backwards in time (before you started thinking about amalgam-related illness) between amalgam work in your mouth and your symptoms then an amalgam-related illness could be suspected.

4.5 Provocation

Provocation can be done by removing an amalgam filling. Write down your symptoms a month before and a month after you have an amalgam filling removed and compare. This way is less informative because you can always suspect that you out of expectation (placebo effect) will get worse after the filling is removed. Nevertheless, if your symptoms do not increase in severity the month immediately after the removal of an amalgam filling you may suspect that you are not suffering from an amalgam-related illness. Tandvardsskadeforbundet (1993) writes that an adverse reaction

“may not take place, if the dentist is extremely careful and provides good protective measures”

5 I BELIEVE I HAVE A (NON-ALLERGIC-) AMALGAM-RELATED ILLNESS - WHAT DO I DO?

5.1 Read

As long as (non-allergic-) amalgam-related illness is not an accepted diagnosis, very few dentists will minimise your mercury exposure during amalgam removal more than what standard procedure requires (water-cooling and high volume suction) unless you yourself demand it (and sometimes (often?) not even then). If a patient has an amalgam-related illness the standard procedure of today is insufficient which is demonstrated by the following: Molin (1990) reported that: if using standard procedure only, all amalgams in a mouth are drilled out in one day, the mercury level of the blood-plasma immediately after the drilling will raise with 300-400% compared to the levels before drilling. In the same way the mercury levels in urine and erythrocytes will both raise by 50%. Then it will take 70-90 days before the levels have returned to the levels present before the amalgam removal. Begerow (1994) made a similar investigation as Molin although he measured only urinary mercury. He found a 30% raise in urinary mercury immediately after amalgam removal, but here the time for urinary mercury levels to return to the levels present before the amalgam removal was counted in single days. There are other examples of why you need to study the subject - but the background is the same; it is not a commonly accepted diagnosis. And therefore, if you are really convinced that you do have a (non-allergic-) amalgam-related illness, you will have to take greater part in your treatment than what is needed in commonly accepted diseases.

5.2 Potential dangers with amalgam removal

If you are convinced / believe / suspect that at least some of your symptoms are (non-allergic-) amalgam-related, you should know that it is NOT proven if one can or can't have an (non-allergic-) amalgam-related illness. If you still want to take the chance of having your amalgam-fillings exchanged, to see if you will benefit from it, as other people and inconclusive reports have pointed out to be possible, you should be aware of some of the potential risks with amalgam-removal, to be able to make a well grounded decision:

At least seven risk factors, to be considered, before you have your amalgam-fillings exchanged, have been pointed out:

- Failure to detect another (treatable) disease because you are so concentrated on the amalgam issue (that you fail to see a doctor as you yourself have found the "cause").
- Failure to treat a proposed psychogenic cause because you are so concentrated on the amalgam that you do not believe in other possible causes to your symptoms.
- Loss of tooth substance.
- Less technically good material.
- Over-sensitivity to the inserted material.
- Wasting money for nothing.
- A period of elevated exposure to mercury during the amalgam-removal-period.

A-B could be avoided by seeing a physician (and a dentist) and attending psychotherapy, if this is recommended, parallel to the amalgam-removal.

C - can be reduced, but not excluded, by using plastic materials such as composite and glass ionomer cement.

D - seems to be a smaller problem now than some years ago, but it is still something to be considered. On the other hand amalgam has been reported to expand and crack the TEETH in some cases.

E - there IS a certain risk, just like there IS with amalgam, that you can be allergic or develop allergy to any of the alternative materials. It has been hypothetical concern that composite could cause even non-allergic negative health effects.

F - as (non-allergic-) amalgam-related illness is only a (scientifically non-proven) probability diagnosis it could be the case that a person do remove his / her amalgam-fillings with no positive effect.

G - could be lowered but maybe not excluded. There has been special concern about foetuses of amalgam-bearing pregnant mothers who want to exchange their amalgam.

5.3 Minimise Hg-exposure / absorption

5.3.1 In the dental chair

During eventual amalgam removal, the dentist could, hopefully, substantially reduce your exposure to / absorption of mercury further, compared to standard procedure (water-cooling and high volume suction), by;

- Putting a rather big transparent plastic bag over your head / shoulders with overpressured fresh air blown into it. In front of the mouth the plastic bag should be reinforced with cofferdam and pressed into the mouth. This way the only thing exposed to the amalgam powder / mercury vapour is the tooth the dentist is working on.
- Drilling as little as possible in the filling, try to lift large parts of the fillings out, so that as little as possible of the filling is pulverised.
- Having well ventilated treatment and waiting rooms and letting air-evacuation equipment discharge its exhaust outside the office.

If the plastic bag/cofferdam-method above wont work the dentist could at least

- Use cofferdam in your oral cavity - it is a rubber sheet and only the tooth with its filling will be sticking out from it. When the dental session with amalgam removal is over the rubber sheet is easily lifted out together with amalgam-particles. No significant increase in mercury levels in urine, erythrocytes or blood-plasma of patients was detected after removing all their amalgam fillings in one day "...using rubberdam, water spray cutting and high volume vacuum evacuator..." (Molin 1995) but increased levels of mercury in the these body fluids was detected when the same procedure was used but without rubberdam (Molin 1990).
- Use a complement to the suction handle that encloses the tooth on all sides but the chewing side. The one I know about is "Clean-Up" by the Swedish firm Agda-group AB (see section 10.10 below).
- Let you breathe through your nose only, using some kind of equipment that provides fresh air (coming from the outside of the building?) or a letting you have a Hg-industry-breathing mask (3M HgMask number 9908) over your nose, during the amalgam removal session.
- Maybe an extra air-suction-device / mechanical exhaust ventilation outside the patients mouth could diminish some of the mercury exposure. One such, hands-free, device I know of is "DentoSafe" (see section 10.10 below).

You yourself could MAYBE lower the mercury uptake in conjunction with amalgam-removal by following these two steps:

- Ingesting 5 g activated charcoal 15 minutes before and 5 g immediately after the dental session.
- Take a shower with hair-wash and changing clothes after the dental session.

5.3.2 As long as there are amalgam fillings in your mouth.

These are some of the factors that has been proposed to raise the mercury efflux from amalgam fillings in amalgam-bearers over the base-line value;

Chewing gum use

Chewing gum use has been shown to raise the mercury efflux into oral air (Abraham 1984, Aronsson 1989, Berglund 1990, Bjorkman 1992, Gay 1979). Raised mercury levels in saliva after use of chewing gum has been reported (Fredin 1988). Nicotine chewing-gum users (mean 10 gum / d for a mean of 27 months) had about 5 times higher urinary mercury levels than non-chewing-gum users in a report of Sallsten (1996). Some of the nicotine-chewing-gum users in this report had urinary mercury levels as high as those usually found in occupationally mercury-exposed persons. Gebel (1996) reported that gum chewers (6 gums / week) had approximately twice the mercury in urine compared with non-gum chewers. Barregard (1995) described three cases of unusual high mercury (Hg) uptake from their amalgam fillings (up to 100 ug Hg/day). Chewing gum and / or bruxism were in this report pointed out as the probable reasons for the increased Hg uptake.

Bruxism (= grinding of ones teeth)

Abraham (1984) reported that: “teeth grinding correlated with blood mercury concentrations ($r = 0.45$, $p < 0.01$)” in a group of non-occupationally exposed amalgam-bearing individuals. Barregard (1995) described three cases of unusual high mercury (Hg) uptake from their amalgam fillings (up to 100 ug Hg/day). Chewing gum and / or bruxism were in this report pointed out as the probable reasons for the increased Hg uptake. Barregard (1995b) examined 88 women. The grade of bruxism, number of amalgam surfaces and urinary mercury was quantified. An positive effect of bruxism up on urinary mercury was seen. The effect was expressed as slightly less than the effect of number of amalgamfillings and chewing gum use. On the contrary, Aronsson 1989 could not relate mercury excretion in urine with grinding and/or pressure of teeth in a experimental group of 27 women.

Tooth brushing

Toothbrushing with an abrasive toothpaste resulted in raised intra-oral air levels of mercury in three reports (Berglund1990, Berglund 1996 and Langworth 1988).

Hot drinks

Bjorkman (1992) found that mercury evaporation after a 1 minute water mouth rinse rose by a factor 1.7 when raising temperature from 35 to 45 grades Celsius. Fredin (1988)found a raise of mercury in oral air after rinse with hot water (55 degrees Celcius). However, contradictory to Bjorkman and Fredin, Berglund (1990, and 1996) failed to find any increase of mercury release into oral air after coffee (60 degrees Celsius) drinking.

Different metals in the mouth

Two different metals in a mouth with saliva (electrolytic environment) will start a battery-effect. That is: an electric current is started, this current will make metal ions get loose from the least noble metallic filling (corrosion), the nearer the two materials are each other the more corrosion there will be. This corrosion takes place even inside an amalgam filling as the amalgam is not homogenous. It seems reasonable that individuals with different metals (including amalgam) in their mouths would have a higher mercury dosage than those with only amalgam: “If all the anodic current could be attributed to the reaction $\text{Hg} \rightarrow \text{Hg}^{2+} + 2\text{e}^-$, the maximum yearly consumption of mercury would be 3mg Hg/cm² of amalgam for an amalgam filling, in contact with an equally large gold construction” (Hakansson 1986) However, I have found very little support in reports in humans that this is an usual mechanism to high mercury levels in amalgam-bearing individuals: Weiner (1993), for example, writes: “The present study does not indicate an increased concentration of mercury in tissues in connection with crown or bridge work and does therefore not indicate an increased uptake of mercury from amalgam fillings due to different metals in contact” Akesson (1991) writes: “Ceramo metallic restorations were associated with higher (31%) U-Hg... subjects who had conventional gold alloy restorations or other types of nonceramometallic prosthetic restorations (n = 76) did not have significantly different levels of Hg in biological

media” Gebel (1996) writes: “contact of amalgam fillings to metal fillings of different type... One aim of the present study was to evaluate possible influences of this contact in vivo on the urinary mercury contents in human volunteers. Neither approximal nor occlusal contacts had any influence on the urinary mercury excretion in comparison to a reference group with similar amalgam status.”

Electro-magnetic fields

The mercury release from amalgam has been reported to increase if placed in front of, not all but, some computer-monitors, in a lab test (in vitro) (Ortendahl 1991). It could maybe be that, in this case, a varying magnetic field induces an electric current in the amalgam which will result in liberation of an extra amount of mercury. Amalgam-bearing workers exposed to sulphuric acid, high static and lower varying magnetic fields excreted more mercury in urine in the end of a 4-week work period than after a week off work (Schmidt 1997). The workers were said not to be occupationally exposed to mercury, however readings of mercury air levels from the workplace were not presented in the article. The mechanism to the raised mercury-excretion during work-periods was not finally determined, even though the authors found it likely that it was possible to be an effect of magnetic field upon dental amalgam. The possibility that the sulphuric acid exposure could lower intra oral Ph and there by increase amalgam corrosion was not excluded.

Acid food

It seems reasonable that acid food such as citrus-fruits will raise the mercury-efflux from amalgam-fillings. The only article I found regarding this and including tests in humans is Berglund 1990. In this article it is described that no increased intra-oral mercury could be found after a green apple was eaten.

Smoking

Even though smoking maybe could be suspected to increase the release and/or uptake of mercury (by raising the temperature and/or changing the chemical environment in the oral cavity) I have not found a single article indicating that smoking raises the mercury efflux and/or uptake from amalgam fillings. On the contrary, Aronsson 1989 could not relate mercury excretion in urine with smoking in a experimental group of 27 women.

How much the daily mercury dosage of an amalgam-bearer will raise, and if clinically relevant is not scientifically clear for all of the above mentioned factors that increase the mercury efflux over the base-line value. However; It seems that people in general do not have to exaggerate the safety measures of above in order to stay healthy. But if there are people who do have a (non-allergic-) amalgam-related illness, lowering even smaller parts of the total mercury exposure / absorption could hopefully / possibly contribute to symptom reduction. People chewing much gum as well as people grinding their teeth should know that they could possibly get substantial amounts of mercury from there amalgam fillings unless they reduce their gum chewing or use an occlusal splint during sleep respectively.

5.4 Remove fillings slowly

If there is such a thing as (non-allergic-) amalgam-related illness (with the report from Molin (1990) in mind) it is not too difficult to arrive at the conclusion that the Hg-exposure could easily become too elevated for a person with such an illness, if all fillings are removed, at least if only standard protective measures is used, during one day. The Swedish Association of Dental Mercury Patients (16 years old, 15 000 members) recommends you to remove only 1 filling each time, then wait 6-8 weeks before you remove the next filling, however if your dentists has good protective measures and you do not feel adverse effects after removal of an amalgam filling you are told that you can proceed faster (Tandvardsskadebunden 1993).

5.5 Minerals / vitamins in pharmacological doses

There are reports from patient organisations as well as some doctors... stating that (some) people with suspected (non-allergic-) amalgam-related illness can benefit from vitamins, minerals... in pharmacological (“mega”) doses.

This is what the Swedish Association of Dental Mercury Patients recommends you to take per day (per os), starting at least two months before you remove your first amalgam-filling (Tandvardsskadeforbundet 1993):

Nutrient	Dose / day taken orally
Vitamin B1 (Thiamine)	50-100 milligrams / day.
Niacin / nicotinamid	25-500 milligrams / day
Vitamin B6 (pyridoxine)	25-50 milligrams / day
Vitamin C (ascorbic acid)	at least 1 gram / day (to be taken >2h apart from selen)
Vitamin E	100-200 milligrams / day
Magnesium	100-300 milligrams / day
Selen	50-200 micrograms / day
Zinc	20-40 milligrams / day

According to the Swedish Association of Dental Mercury Patients (Tandvardsskadeforbundet 1993) a dose of 10-50 g C-vitamin is sometimes used to counteract certain diseases, and diarrhoea will follow if you ingest too much C-vitamin. Further more, oral ingestion of 25-50 mg sulphur powder 3 times a day has anecdotally been reported as beneficial (Tandvardsskadeforbundet 1993).

Then there are many other nutrients (Coenzyme Q-10, folic acid and pyridoxine per os together with intra-muscular injections of vitamin B12 (preferable as methylcobalamin?), algae, garlic, amino acids as acetylcystein...) recommended from various people / organisations, you will have to do the “trial and error” here besides reading about it.

To my knowledge, there are no human clinical controlled studies of the effectiveness or the presence / non-presence of side-effects, in individuals with suspected (non-allergic-) amalgam-related illness, of the use of vitamins / minerals as suggested above. The use of minerals / vitamins as suggested above... is based upon animal and in vitro studies in addition to experiences among patients, and / or (some) physicians who treat patients, with claimed / suspected / probable (non-allergic-) amalgam-related illness.

Here well controlled studies in humans would be welcome. But, bearing in mind that there are people who report that they do not tolerate mega doses of selenium, magnesium, B12 injections, B-vitamin-complex... and that maybe only some people benefit from a treatment like this, this kind of study perhaps ought to be made with each patient as its own control.

5.6 Reducing gastro-intestinal (re-) uptake of mercury

It is rather large amount mercury that passes through the gut every day in amalgam-bearers (Barregard 1995, Edlund 1996 and Skare 1994). This amount could be taken as an indication that there could be of interest to try to lower the uptake of mercury from the gut, even though there usually is stated that only a minor part of the inorganic mercury in the gastro-intestinal canal is absorbed.

Inorganic mercury, from your fillings, swallowed with saliva can be taken up from the gastro-intestinal canal and mercury excreted into the gut (with bile, by the sloughing of of the gut’s mucous cells, or Hg in blood-> Hg in salivary glands-> Hg in saliva-> Hg swallowed into the gut) can be reuptaken.

Dietary fibres could maybe lower the (re-) uptake of such mercury.

5.7 Ethanol

The Swedish Association of Dental Mercury Patients (Tandvardsskadebundet 1993) states:

“The intake of 5-6 cl of alcohol (40%) ½ to 1 hour prior to dental treatment can protect you from some of the mercury exposure. The alcohol reduces absorption of mercury vapor in the lungs and keeps the metal vaporized in the blood long enough to be exhaled again”

When looking at scientific reports it seems that alcohol consumption can decrease the whole body burden and/or the uptake of mercury as seen from these human studies:

- Nylander (1987) reported:
“In 9 cases with suspected alcohol abuse mercury levels in the occipital lobe were, in most cases, somewhat lower than expected based on the regression line”
- Weiner (1993) reported:
“Chronic alcohol abuse was associated with decreased concentrations of mercury in occipital cortex”

(Occipital lobe / cortex is part of the brain).

Nylanders report above and this report by Weiner are both a bit hard to interpret because alcoholists would possibly eat less regular food (including fish) and could thereby theoretically have a lower food-related mercury-exposure than non-alcoholists, why these two reports alone do not prove that chronic alcoholism lowers the mercury retention from amalgam-fillings.

- Martin (1994) reported that the habit of alcohol consumption, in dentists, resulted in lower urinary mercury levels:
“a clear inverse dose-response relationship was seen between alcohol and urinary mercury”
- Hursh (1980) reported that ingestion of about 1 litre of beer ingested half an hour before mercury vapour exposure, by three human volunteers, reduced retention of mercury vapour and increased the amount they exhaled.
- Nielsen-Kudsk (1965) exposed 4 human individuals for mercury vapour (about 200 ug/m³) and alcohol (20-27 g alcohol corresponding to about 6 cl of 40% spiritus.) Half an hour to an hour after alcohol ingestion the retention of mercury vapour had decreased, from about 75-85%, to about 55-65% of inhaled amount. There seemed to be a strong tendency that individuals that ingested more alcohol or whose body weight were less also reduced their mercury uptake after alcohol ingestion more than those with lower intake of alcohol or higher body weight, pointing in the direction that it could be possible that an even greater amount of alcohol could lower the uptake of mercury even more.

Studies where animals have been exposed to mercury and alcohol show that alcohol

- given before mercury exposure decreases whole body burden of mercury (Hursh 1980, Khayat 1984) as well as the retention of Hg vapour (Hursh 1980).
- given after mercury exposure increases exhalation of mercury (Dunn 1978).

However, the question if alcohol is beneficial in humans exposed to mercury vapor during amalgam removal or of use when treating mercury-intoxicated patients remain to be studied / confirmed or dis-confirmed because lack of human clinical studies that tests if there is a positive net effect on symptoms and because there has been some reports that points out possible negative effects:

- Buckell (1946) reported:
“The most characteristic symptom, though it is not the first to appear, is mercurial tremor... Alcoholism favours its development, and it is claimed that no total abstainer has ever suffered from tremor in severe form”

- Hursh (1980) reported that alcohol could increase the amount mercury in the liver although the whole body retention decreased.
- Khayat (1984) reported from an animal experiment that alcohol can increase the mercury retention in kidney and adrenal cells.
- Tamashiro (1986) reported that in animals:
“Ethanol potentiated the toxicity of methyl mercury in terms of neurological manifestations (hindleg crossings and abnormal gait) and mortality. The magnitude of effect depended on the concentration of ethanol administered. The concentration of mercury in the kidney and brain also increased with the dose of ethanol given”

Methylmercury is organic mercury which we mainly get from eating fish. From amalgam-fillings we get inorganic mercury. But as the amount methylmercury from fish is, on a group level, not far behind the amount of inorganic mercury from amalgam-fillings (see section 7.1) (and in some individuals even higher) it could be that chronic ethanol intake makes a substantial fraction (the methylmercury) of our mercury-dosage more toxic than what it would have been in non-ethanol-drinkers.

5.8 C-vitamin infusion

Reports, published in non-scientific media as Queen (1991), have stated that people, with suspected amalgam-related illness, benefits from intravenous administration of about 0.75 g C-vitamin / kg body weight (sic!) during a few hours, especially during (sic! -in the dental chair) amalgam removal. There seems to be done very little (published) research on this. One article (Dirks 1994) stated that it was not shown that mercury-excretion in urine was increased during 24 h after such a C-vitamin-administration as described above. An abstract (Hall 1994) from a conference stated that there was an, up to about 100-fold, increase of mercury in faeces, but not in urine, after such a C-vitamin administration as described above.

5.9 Chelators, for example DMSA and DMPS

A mercury “antidote”. Captures mercury and forces the captured mercury to be excreted, thereby lowering the body burden of mercury. Can cause unwanted side-effects (Englund 1994), in other words - avoid it unless you really need it.

Mainly eliminates easily accessible (= extracellular and outside Central Nervous System (CNS)) mercury from your body. Functions well, and are “State-of-the-art”, in acute or subacute mercury intoxications.

In the amalgam-related illnesses it’s positive effects remain to be proven. Englund (1994) orally administered 20 mg / kg DMSA per day or placebo for 14 days to a total of 20 individuals with suspected (non-allergic-) amalgam-related illness. Mercury excretion in urine rose by average 65 % during this 14 days. Only one out of 10 symptom-indices improved significantly ($p < 0.05$) in the DMSA group compared to a control group who received placebo: a decrease in fatigue-inertia, but one out of ten could be a coincidence.

The experience among members of the Swedish patient organisation is mixed when talking about effects of DMSA and DMPS:

“Some patients do feel much better, others worse, often only temporarily. A few have experienced long-lasting adverse effects” (Tandvardsskadeforbundet 1993).

In non-occupationally exposed individuals oral administration of a chelating agent only raises the urine-mercury excretion by a factor usually less than 10 for a few hours - and that is really very little compared to the body burden.

In an acute mercury intoxication, on the other hand, a much greater part of the body’s mercury burden is easily accessible (= extracellular and outside Central Nervous System (CNS)) and therefore a chelator-cure can lower the body-burden a great deal.

DMSA stands for: meso-2,3-dimercaptosuccinic acid.

DMPS stands for: dimercaptopropone-1-sulfonate.

5.10 Sweat therapy

Putman (1972) reports that if workers in the Almaden mercury-mines showed signs of mercury-intoxication they were treated by induced sweating in order to sweat the mercury out. To my knowledge, no scientific reports have been publicised about the efficiency of increased sweating as a way of treating mercury-intoxication. However Lovejoy (1973) found considerable amounts of mercury in sweat (120-350 ug Hg/litre induced sweat and 155-185 ug Hg/litre urine) in mercury exposed chlorine-factory workers, the unexposed controls had 5-8 and 5-7 ug Hg/litre respectively.

5.11 Social environment

If you see amalgam-related illness as an organically induced neurasthenic syndrome it seems to be beneficial, from the patient's point of view, to be stimulated (but not stressed) and having the right amount of demands (that is a light noradrenalin activation) in a positive atmosphere (that is a slight 5-HT(=serotonin) activation). The above is taken from an article (Hansson 1992) written in Swedish by Ronnback among others. Part of this is described in Ronnback (1992).

5.12 Treat symptom

If a person has such a (non-allergic-) increased sensitivity to mercury / amalgam that he / she really suffers from a (non-allergic-) amalgam-related illness the symptoms could increase in connection with amalgam-removal. Since there could be an increase in symptoms and it is relatively short lasting, it would not be out of place to facilitate the amalgam-removal phase by treatment of the symptoms during this time.

5.13 Wait

Sorry to say, but it takes time to recover from a Hg-intoxication. Literature about chronic Hg-intoxication (Vroom 1972) as well as experience among individuals with suspected amalgam-related illnesses (Tandvardsskadeförbundet 1993) points out that it can take months up to a couple of / some years before you get a good / total symptom reduction after ceased exposure. Some symptoms can remain even after several years (Kishi 1993), especially in heavily chronically Hg-exposed individuals.

5.14 Isn't there anything else I could do?

Among those who are convinced that they are suffering from a (non-allergic-) amalgam-related illness there are individuals reporting that they benefit from a healthy life style; avoiding ingestion of heavy metals (one can for example increase daily lead-dosage by drinking some wines or drinking wine from wineglasses of crystal...), eating a lot of (biodynamically grown?) vegetables, taking regular walks... It is not unusual that patients with suspected (non-allergic-) amalgam-related illness report that they do not tolerate heavy physic workout or massage. Both these activities could theoretically cause increased liberation of mercury from depots in ones body. Some people among those who are convinced they are suffering from a (non-allergic-) amalgam-related illness report increased symptoms after ingestion of titaniumdioxide (colour in tablets...), ingestion of iron in excess, the use of aluminium saucepans or by wearing metals (especially gold?) next to the body (intrauterine contraceptive devices with copper, watches, jewellery...)...

Regarding the above it could maybe be of interest to study:

- Shimojo (1994), who studied mercury distribution in a control group of mice compared with one group of mice that had been swimming 1 h / day, reported: *"It was concluded that exercise training is a factor in distribution changes of mercury after exposure to mercury vapour, though it is not a factor in the total absorption and excretion of mercury"*

Among other organs that had an comparatively raised level of mercury in the trained mice was the brain.

- Soremark (1968) who reported:
“Each of the ten girls wearing gold jewelry showed a significant amount of gold in her cranial hair. The concentration was several times greater than found in the control group”

5.15 Did you not improve your health condition after a complete amalgam removal?

These are some hypothesis to why some individuals with a suspected (non-allergic-) amalgam-related illness did not get a symptom reduction after a complete amalgam exchange:

- The individual did not have a (non-allergic-) amalgam-related illness.
- The individual has not waited long enough (up to 3-5 years or even longer?).
- The alternative material is causing new problems (especially gold or other metals).
- Diverticulums in the Gut which contends amalgam-particles / mercury, from which mercury is slowly released.
- Amalgam / mercury is still present in the mouth; under gold-crowns, in amalgam tattoos in the gingivae...

5.16 How is a classic inorganic Hg-intoxication treated?

The classic, often heavy occupational or accidental, inorganic mercury poisoning is usually treated by:

- Cessation of the exposure, which is the single most important measure.
- In acute and subacute intoxication, chelators are usually given (for example DMSA, DMPS...).
- Symptomatic treatment.
- Letting time have its course.

These are, to my knowledge, the only treatments that, so far, are “State-of-the-art” in inorganic mercury intoxication.

6 ALTERNATIVE RESTORATIVE MATERIALS

Neither amalgam nor alternative filling materials has been biocompatibility tested or side effect reported in the same way as pharmaceuticals has been for a long time.

Although it is unusual, people can be allergic to and / or get local oral reactions because of (ingredients of) any of the materials below (except maybe ceramics), as well as to (ingredients of) amalgam (as mercury).

Even if it is not likely that ceramics cause allergy, the ceramic will have to be cemented in to the cavity and the cement can cause allergic reactions.

6.1 Composites

Inexpensive. Tooth-coloured. When used when there is need for a new small filling composites is regarded as tooth-conservative (DHHS 1993). Can shrink which could lead to micro-leakage and secondary-caries (DHHS 1993, p II-1). Composites are highly technique sensitive (DHHS 1993 p II-1), and therefore the result can differ widely dependent on the skill of the particular dentist. Hypothetical concern about possible side effects (other than allergy) from different components released from composites has been put forward.

6.2 Glass ionomer cement

Inexpensive. Fairly tooth-coloured. Adheres to the tooth and releases fluoride all the time, both reducing risks of secondary-caries. When used when there is need for a new filling glass ionomer cement is regarded as very tooth-conservative (DHHS 1993 page I - 21). Glass ionomer cements are technique-sensitive (DHHS 1993 p II-2). Glass ionomer cements are not resistant to mechanical wear, that's why it is mainly used for small fillings and not for big fillings with great chewing stress. Some people who suspect that they have an amalgam-related illness report that they do not tolerate glass ionomer cement.

6.3 Ceramics

Expensive, costs about the same as Gold. Tooth-coloured, can be very aesthetic. Both porcelain and glass are ceramics. Ceramics are technique-sensitive (DHHS 1993 p II-3). They are resistant to mechanical wear, but a bit fragile and can crack in a FEW cases. When replacing amalgam fillings with ceramics the cavity where the amalgam-filling was placed must be altered so there are no undercut - thereby losing healthy tooth substance (DHHS 1993 p I-9).

6.4 Gold

Expensive. Technically a very good material. Dental gold is not pure gold. (It can contain some of these metals in it; Au, Pt, Pd, In, Ir, Fe, Cu, Ag, Sn, Zn.) Small amounts of gold is liberated from the fillings and absorbed by the body. However gold is not as toxic as mercury. When replacing amalgam fillings with gold inlays the cavity where the amalgam-filling was placed must be altered so there are no undercut - thereby losing healthy tooth substance (DHHS 1993 p I-). People suspecting that they have an amalgam-related illness often report that they do not tolerate gold, especially not when there still are amalgam-fillings left in the mouth (is this because of battery-effect ->increased corrosion->increased mercury efflux from the amalgam-fillings?).

6.5 Recommendations from patient organisations

To my knowledge there are no double-blind controlled studies, in humans with suspected (non-allergic-) amalgam-related illness, which could answer the question IF and then which alternative materials can potentially give side-effects and which are usually well tolerated.

However patients (Tandvardsskadebunden 1993) as well as some dentists / physicians claims that there is a difference in how well tolerated different alternative filling materials are in this patient-group.

Swedish Association of Dental Mercury Patients says (Tandvardsskadebunden 1994) that:

- Most composites function well in the majority of the patients, however Heliomolar and Helioprogress from Vivadent, Nulite-F, P-50 and Restorative Z-100 are the composites that sensitive individuals tolerate the best.
- But P-10 and P-30 (3M), Profile, Concise, Prisma-fil and Prisma fulfil, often give symptoms in sensitive patient-groups.
- Class ionomer cement is said to be a well tolerated alternative for many individuals, although again some sensitive individuals may not fully tolerate the metallic leakage from the cement. Recommended are: Fuji Inomer Type II (G-C Dental) and Ketac-Fil Aplicap (ESPE). Warned for are Ketac-Silver Aplicap (ESPE).
- Ceramics are usually well tolerated. Potential side-effects seems to be connected to the cement that has to be used to keep the ceramic in place. Recommended are: Ivoclar Empress, Dicor, Vitadur, Vita Inceram, Hi-Ceram, Duceram, Cerestore and Ecelco.
- Cement to glue the a ceramic in place, recommended are GC Fuji I (GC Dental) and Sonocem, but even Dualcement (Vivadent) is tolerated by the majority if isolated with a bonding as Gluma 2000 or Syntac:
- Gold is warned for.

7 MERCURY SOURCES

7.1 Mercury sources, overview

According to WHO (WHO 1991) these are the general sources of mercury in the body (ug / day):

- Air: 0.040
- Fish 2.34
- Non-fish food 0.25
- Drinking-water 0.0035
- Mercury vapour from dental amalgams 3-17.
- Yes, mercury vapour from dental amalgam alone is, on a group level, a bigger source than all the other sources together.

Breast milk from fish-eating mothers can be quite high in mercury.

7.2 Is amalgam really the biggest mercury-source?

7.2.1 Introductory remarks.

There is some debate whether amalgam or fish is the biggest mercury-source in the general population even though the WHO-report clearly states amalgam as the biggest source. The WHO report based their data on intake alone. Excretion and accumulation in non-amalgam bearers vs. amalgam-bearers, as shown below, also points strongly in the direction that amalgam is the single biggest mercury-source in non-occupationally exposed amalgam-bearers on a group level. In individuals and in sub-populations consuming much fish and / or consumes a high proportion highly mercury-contaminated fish, the fish can be the biggest source of mercury.

7.2.2 Excretion of mercury

The major part of absorbed mercury is excreted in urine and feces.

Over 90% of the mercury excreted via feces comes from dental amalgam (Barregard 1995, Bjorkman 1997, Edlund 1996, Osterblad 1995, Skare 1994). This is based on comparison of non-occupationally exposed amalgam-bearers on the one hand, and non amalgam-bearers on the other hand. How much of this Hg that passes right through the gastro-intestinal canal is not clear, however it is usually assumed that 5-20% of inorganic mercury in the gastro-intestinal canal is absorbed.

Approximately 75% of the mercury excreted via urine comes from dental amalgam according to most reports (Begerow 1994, Berglund 1990, Molin 1990, Molin 1995, Schulte 1994, Zander 1990). However, Gebel (1996) reported 60%. These mercury values in urine are based on comparison of non-occupationally exposed amalgam-bearers on the one hand, and non amalgam-bearers on the other hand.

Conclusion is that dental amalgam is by far the biggest source to excreted mercury.

7.2.3 Accumulation of mercury in humans

In deceased adult humans there is, on a group level, a correlation between the amount of Hg in brain and the number of amalgam-fillings (Nylander 1987, Weiner 1993). The presence of raised mercury levels, in it self, does not necessarily cause pathologic reactions - the levels will have to exceed a persons threshold level. The problem is that we do not know the lowest possible threshold level in brain / Central Nervous System (CNS), especially not in sensitive individuals. "There is very little information available on brain mercury levels in cases of mercury poisoning, and nothing that makes it possible to estimate a no-observed-effect level or a dose-response

curve” (WHO 1991 p20). But the levels in brain / Central Nervous System (CNS) from amalgam-fillings alone ARE, on a group level, BELOW the levels that occupationally exposed individuals, for example dentists, show without being diagnosed as suffering from mercury-poisoning (Nylander 1991).

In foetuses / children we have even less information about which mercury levels one could regard as safe. Therefore a report that show that mercury, from amalgam-fillings in the mother, passes over to the foetus in animals (Vimy 1990) has awoken some concern. Drasch (1994) has reported that mercury levels measured in deceased human foetuses (kidney cortex and liver) and deceased infants (kidney cortex and brain cortex) significantly correlate with the number of dental amalgam-fillings of the mother. Some levels in some children were above those of adults without amalgam, but the mercury levels in both foetuses and children did not, on a group level, exceed the levels of deceased amalgam-bearing adults have. However, some of the children in Drasch’s report had mercury levels in their kidneys as high as those of amalgam-bearing adults or children.

Differences among individuals in how easy mercury is transported into the brain over the blood-brain barrier could possibly lead to different mercury-levels in brain in different individuals at a given whole-body dose of mercury. This could possibly explain some of the inter-individual differences in susceptibility to mercury; that is why some individuals get Central Nervous System symptoms at a given whole body dose while other do not. However, as far as I know it has never been investigated if deceased people with claimed / suspected amalgam-related illness has higher mercury levels in brain than control individuals in brain, although this would be interesting to know.

7.3 Mercury dose/day from amalgam vs. toxic dose

The WHO Study Group writes about occupational exposure to mercury vapour in the air:

“Exposure in the range of 25 to 80 ug/m3... increases the incidence of certain less severe toxic effects that do not lead to overt clinical impairment. These subtle effects are defects in psychomotor performance, objectively detectable tremor, and evidence of impair nerve conduction velocity, which are present only in particularly sensitive individuals. The occurrence of several subjective symptoms, such as fatigue, irritability, and loss of appetite, is also increased... Some of the exposed people develop proteinuria.” (WHO 1991 p 111).

Occupational exposure to 25 (80) ug Hg / m³ air would correspond to a daily dose of somewhere about 100-200 (300-600) ug / day (8 h / day, 5 days / week, 48 weeks / year, breathing of 1-2 m³ of air per hour containing 25 (80) ug Hg / m³ of which 80% is absorbed in the lung alveoli’s). The industrial threshold value of 50 ug Hg / m³ air would correspond to a daily dose of somewhere around 200-400 ug / day.

The uptake of 3-17 ug Hg / day that is reported for normal amalgam-bearing people from their amalgam-fillings, on a group level (WHO 1991), is according to the above about 1/5-1/200 of the dose (100-600 ug Hg / day) where, sub-clinical to clinical, health effects, on a group level, have been reported in persons occupationally exposed to inorganic mercury.

Few persons have higher uptake of mercury reported from their amalgam. Barregard (1995) stated that it is possible to get maybe as much 100 ug Hg / day from, as it seems, amalgam-fillings, probably the mechanism in this case is heavy bruxism and / or chewing gum use. People using (nicotine) chewing gum has been reported to be at risk of obtaining raised mercury dosage from their amalgam (Sallsten 1996).

7.4 Pharmacological, preservatives...

Some medicines, vaccine, contact lens solutions... contain mercury. Look for the words; thiomersal, merthiolate or words with; -mer- or hydrarg in the

information about them. Usually they are preservatives, the amounts are not high enough to affect people other than those who use a lot of medicine and / or are extra sensitive to mercury. However, patients with hypogammaglobulin, who receive IgG with mercury as a preservative, can be at risk of getting raised (>30 ug / l) mercury levels in urine (Haeney 1979).

Mercury has been used, in humans, as mercuric chloride solution under operations to kill cancer cells implanted on healthy tissue (Laundy 1984) or as a local antiseptic ("Merbromine" - Registered Trade Mark) (Slee 1979), as far as I know this still is the case sometimes - the mercury amount absorbed here is enough to cause intoxication in some cases. An organic mercury, thiomersal, has been used as antiseptic to treat infants with omphaloceles whereby sometimes levels of mercury usually looked upon as toxic levels were induced in blood and organs of the infants (Fagan 1977).

7.5 Skin lightening creams / soaps

There are soaps / creams sold to lighten ones skin. These soaps / creams can sometimes contain 1-10 % mercury as one ingredient. These amounts of mercury can cause intoxication. Mercury containing soaps / creams are banned in most countries in the western world. (WHO 1991).

7.6 Paint

Mercury is used as preservative in some latex paints. When painting with such a paint the air-mercury-levels will rise and stay that way for weeks-months (Aranow 1990, Beusterien 1991). However, usually, not to such high levels that it has been shown to affect normal people. However, if you have a raised sensitivity towards mercury you should know about it, because there is mercury-free latex paint available.

7.7 Mirrors

Old mirrors could be coated with amalgam (by definition, amalgam always consists of mercury and other metals) on the back side. If it is so, they are normally not painted on the back side. Silver-coated mirrors on the other hand are normally painted on the back side. A mercury-mirror will liberate mercury as mercury vapour (Hadsund 1993), but again far from the amount enough to affect normal people.

7.8 Mercury spill from thermometers, barometers...

Yes, mercury spill will result in vaporisation of the mercury before the mercury is properly cleaned up / eliminated. Even spill of the small amount of mercury in a thermometer, not properly cleaned up, has been reported to cause intoxication in young children (Cloarec 1995, von Mühlendahl 1990). To clear spilled mercury; try to pick it up with some instrument and pour it into a bottle filled with water. Then seal the bottle and get rid of it (in an environmentally correct way). Then if there is any remaining mercury: use powdered sulphur or finely divided zinc and spread it all over the area where it is suspected to be remaining mercury. Brush it up - do not use a vacuum cleaner (will blow mercury up in the air and the vacuum cleaner will be contaminated). If you finally (after successful total mercury recover) use the vacuum cleaner, immediately dispose the vacuum-cleaner bag after the cleaning is finished as an extra precaution. If the mercury has been spilled on something from which it is difficult to remove it entirely, for example a rugged carpet it is usually recommended to get rid of the mercury-contaminated object if possible, otherwise (as for wooden floors with slots...) try to decontaminate it and then monitor the air-mercury-levels nearby to check if they have decreased to an acceptable level. It is really not dangerous to get mercury on your hands if; A) it is a once in your life experience and nothing you do every day, B) you are not oversensitive to mercury, and C) you wash your hands as soon as possible after the contact with mercury.

7.9 Bringing mercury, non-voluntarily, home from work

It has been reported that people occupationally exposed to mercury can, non-voluntarily, bring mercury home (probably in / on there clothes / shoes) in such amount that raised urinary mercury levels (25 ug / l compared to a control group who had 5 ug / l) can be detected in their children (Hudson 1987).

8 MISCELLANEOUS

8.1 Women in and before childbearing age

At present, there is not scientific support for saying if amalgam is or isn't safe. A continued use of amalgam (as well as other materials) must be based on a calculation of risks and here a special concern has been given to mercury exposure to developing fetuses.

The Swedish National Board of Health and Welfare has recommended, as a precaution, that amalgam-work should be avoided, as far as possible, for pregnant women (Socialstyrelsen 1991).

Drasch (1994) has even suggested that the use of amalgam in women before, and in, childbearing age should be reconsidered.

The WHO Study Group (WHO 1991) writes:

“Some studies have found miscarriages and abortions after occupational exposure to mercury, but other studies did not confirm these effects...” The WHO Study Group in 1980 stated; “...The exposure of women of child-bearing age to mercury vapour should be as low as possible. The Group was not in a position to recommend a specific value” (WHO 1980). This statement is still prudent and will remain so until new data become available.”

“In view of the fact that mercury vapor easily traverses the placenta, it cannot be precluded that exposure to mercury vapor during pregnancy gives rise to brain damage or results in inhibition of brain development of the fetus. However, experimental or clinical observations which allow conclusions concerning the level of exposure at which such damage may occur, are not available” (Berlin in: Friberg 1986 page 402)

“Estimating these effects of mercury from dental amalgam based on the current literature is difficult because of the following:... Susceptibility of the CNS can vary with critical periods of brain development. Experience with other agents damaging the nervous system (e.g., lead, radiation, alcohol, etc.) has demonstrated that we might expect a wide range of potential CNS dysfunction, depending on the stage of development at the time of exposure” (NIH 1992)

9 PERSONAL CONCLUDING REMARKS

I (Leif Hedegard) am not a doctor or a scientist. However, I have, some years ago, studied medicine for two and a half years.

I am not an expert on this subject, and therefore I have tried, even though it is far from complete, to include scientific references to statements / facts. Where I have found no scientific references, I have tried to state / indicate (using words as maybe, hopefully...) that it is a belief / non-scientific-report / clinical experience and not (yet) scientifically proven to be true / false or clinically significant / non-significant. In some cases I have not mentioned where the information came from, usually this is because I am working on checking and double-checking the references to this or because the information did not come from scientific media.

As an answer to a request that I should state my interest in the amalgam-controversy as this would make it easier, for readers of this FAQ, to be aware of potential biases from my side the following hopefully provides enough information:

Over the past years I have suffered from long periods of multi-symptomatic illness. In the search for ways to improve my own health I have, among other things, read articles in the amalgam- / mercury-field. I myself do NOT KNOW, beyond all reasonable scientific doubts, if there is or isn't such a thing as a (non-allergic-) amalgam-related illness. My present belief is, however, that some people are indeed suffering from a (non-allergic-) amalgam-related illness as well as there are people suspecting / claiming that they are suffering from a (non-allergic-) amalgam-related illness who really suffers from something else.

You can not always get a straight answer in advance and often one has to make decisions (even in medicine) based upon non-absolute grounds (as experience, belief, tradition, consensus-statements, theoretical calculations as risk management, common sense...). But in this particular matter it is potentially possible that we will, in the future, get a (more) straight answer with more relevant quality science. I would like to know the answer and therefore I would like to see more such science to clear the question out.

For me it seems:

that a statement like “-amalgam is scientifically proven to be safe” is not grounded on science (DHHS 1993 page 4, 15 and III-29) and therefore false, even though amalgam may (hypothetically), in the future, be proven to be as “safe” as we can prove anything (that is when ALL ways of showing the opposite has failed). If others and I accept statements like “amalgam is safe” we also will have to accept that there will not be much science in the field - why should anyone investigate / give money to investigate the possible danger of something that is already established as “proven to be safe”. This is one reason why it is so important to say “we do not know if amalgam is safe or not” instead. DHHS (1993 page 15) writes:

“additional research is needed to resolve the question of whether the mercury in dental amalgam poses any significant health risk to patients”

- that a scientific / political... mistake was to, a priori, for long time consider dental materials as being biologically inactive - they have thereby never been bio-compatibility tested or side-effect-reported in the same way that pharmaceuticals has been for a long time. For example DHHS (1993) states: “encourage dental care providers to report adverse reactions” which of course is good but at the same time indicates that, at least, up till 1993 it has not been a rule to report side-effects, from dental materials, in USA. There has been recommended that a special program should be established for reporting and investigating adverse reactions to dental materials (NIH 1992). Mjor (1992) writes:

“ All active testing programs for restorative materials, as for dental materials in general, have (until recently) been limited to laboratory evaluations of their chemical and physical properties... no effective reporting system from general

dental practice has been established in any country to record side-effects equivalent to that of drugs”

- a bit odd that the sales and implantation of dental material in general is permitted without declaration of the contents to the patient, dentist or the scientific society. There has been recommended that all restorative materials should be provided with information listing all the constituents used to make each material (DHHS 1993 p 19, NIH 1992), information that should then be referenced to in each patient's chart (NIH 1992). Why has this not been done long ago?
- that dental amalgam is, from a toxicological point of view, unsuitable / non-desirable as a dental restorative material.
- that it is time to consider if not recommendations to lower the patients Hg-exposition further during work on amalgam (compared to water-cooling and high volume suction) should be made.
- that the relevant questions concerning mercury-dose in the general population should be: Do the mercury-doses in the general amalgam-bearing population from all sources together reach toxic levels? (The answer I find is: No, it does not seem so) If not, could there instead be that a minority of the population has such a high mercury-dosage from amalgam (and other sources) and / or has got such raised (non-allergic-) sensitivity to amalgam / mercury that they can get ill from their amalgam fillings? (The answer I find is: We do not know)

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You can find a WWW-version of this FAQ at the www-address:

<http://www.algonet.se/~leif/AmFAQigr.html>

The WWW-version of the FAQ contains some additional information, for example there are abstracts to the references used in the FAQ available as well as some additional abstracts to articles in the field. A few fulltext-articles can also be found here, as well as a formatted version of the FAQ (in .pdf-format).

10 WHERE CAN I GET MORE INFORMATION?

10.1 Official review / toxicology handbook

The WHO report from 1991. It is over 5 years since the meeting that this WHO-report is grounded on was held, but it still is a good source of knowledge in this field.

The "Handbook on the Toxicology of Metals" (Friberg 1986) is, in my eyes, a good handbook in metal-toxicology. Even though it is about 10 years old it outlines the toxicological principles / symptoms / and methodologically problems in a nice form. However, figures are some-times not up-to-date when seen in light of more recent science in the field.

10.2 Pro-amalgam papers

DHHS (1993) states:

"it is inappropriate at this time to recommend any restrictions on the use of dental amalgam."

This statement is based on lack of evidence for risk rather than evidence of safety as can be seen from this statement:

"health risks cannot be totally ruled out because of the paucity of definite human studies... additional research is needed to resolve the question of whether the mercury in dental amalgam poses any significant health risk to patients (DHHS 1993)"

NIH (1992) states:

"Available data do not justify discontinuing the use of any currently available dental restorative materials or recommending their replacement"

This statement is based on lack of evidence for risk rather than evidence of safety as can be seen from this statement:

"Lack of reliable quantitative estimates of the risks and benefits of the various dental materials discussed at this conference precludes calculation of benefit/risk ratios. The paucity of data concerning predictable risks associated with restorative dental materials was striking... While the current evidence supports the concept that existing dental restorative materials are safe, it must be recognized that the supporting data are incomplete" (NIH 1992)

Bergman (1992) states:

"Available data do not justify discontinuing the use of silver-containing dental amalgam fillings or recommending their replacement"

10.3 Anti-amalgam papers

Lorscheider (1995) states:

"Although human experimental evidence is incomplete at the present time, the recent medical research findings presented herein strongly contradict the unsubstantiated opinions pronounced by various dental associations and related trade organisations, who offer assurances of amalgam safety to dental personnel and their patients without providing hard data"

Pleva (1994) states:

"The potential risk from amalgam mercury can hardly be compared to other risks such as lead from car exhaust gases or mercury from fish. There are substantial differences as regards continuity and levels of exposure and chances to avoid the exposure... The dental profession has been reluctant to publish the whole truth"

about Hg exposure from DA and to initiate corrective measures. This reluctance is possibly due to the symbiosis existing between dental scientific organisations and the dental industry... It might not be possible to reach a complete scientific proof of Hg poisoning by DA. However, in science this is not a new situation”

Hanson M & Pleva J (1991) states:

“The extensive published knowledge about mercury toxicology indicates that toxic effects from amalgam mercury can not be excluded... A comprehensive bibliography with over 8000 titles on mercury and its health effects can be obtained from the authors”

Bio-Probe Newsletter

“Bio-Probe Newsletter”, is a bi-monthly published newsletter with abstract of and comments on science in the field... It costs USD 65 / year (Outside USA: USD 80 / year). Editorial office is at:

Bio-Probe, Inc.

P.O. Box 608010

Orlando, FL 32860-8010

Tel: +1 407 290 9670.

Fax: +1 407 290 4149.

Bioprobe has an home-page on the WWW:

<http://www.bioprobe.com>

As well as an e-mail-address: bpinfo@bioprobe.com

Heavy Metal Bulletin

“Heavy Metal Bulletin” is an international magazine (International forum focusing on immuno-toxic effects of dental-fillings and related disorders.) which is more easy to read than scientific articles although not as well referenced. You can get it from Monica Kauppi, Lilla Aspudsvagen 10, S-12649 STOCKHOLM, SWEDEN, Tel / Fax +46 8 184086. VISA, Master Card, Eurocard, JCD and Electron cards are welcomed if card number and expiring data are provided. Or from IAOMT Great Britain (address below). It costs for European residents USD 50 / year or low income USD 18 and for non-European residents USD 65 / year or low income USD 24 / year. 3 issues / year. You can receive either the English or German language edition.

International DAMS Newsletter

“International DAMS Newsletter” is another easy to read publication. It is a quarterly newsletter that focuses on scientific research, personal recovery stories, detoxification methods, mercury toxicity, root canal therapy, cavitations, and fluoride therapy. Subscribe from DAMS (address under section 10.6 below). The subscription rate is USD 20.00 / year in U.S., Canada / Mexico USD 25.00 / year U.S. funds and USD 28.00 / year U.S. fund in all other countries.

10.4 “Amalgam” mailing list

If you have an Internet e-mail address you can subscribe to a mailing list called “AMALGAM” where questions about amalgam / mercury / health is discussed. To subscribe to the list send an e-mail to: LISTSERV@listserv.net (or LISTSERV@gmd.de) with the following message in the first line of the body of the e-mail:

SUB AMALGAM Myfirstname Mylastname

All the messages, in this amalgam mailing-list, from 1992 and forward are archived year by year or month by month and are retrievable from the listserv by any subscriber of the list.

10.5 Other information on Internet

If you have full Internet-access you can find some information at gopher and WWW-servers:

MSDS

The firm Fisher Scientific is a place to get Material Safety Data Sheets:
<http://www.fisher1.com/fb/itv?16..f97.3F.msf0007.49..4.9>.

For more MSDS: University of California Material Safety Data Sheets Resources
<http://www.ucop.edu/riskmgmt/ohp/msds.html>

Kolp (1995) has evaluated different MSDSs for accuracy and completeness and found them in general to be good starting points, but found also that the information, especially the health effect information, in them can and should be improved.

Medline

Search the world's largest biomedical database.

Free access via www at NIH (a service that is new from June 26 1997)
(<http://www.nlm.nih.gov/databases/freemedl.html>)

Statements

- Agency for Toxic Substances and Disease Registry (USA) has released a statement about mercury: "ATSDR Public Health Statement, December 1990" which can be found at:
<http://atsdr1.atsdr.cdc.gov:8080/ToxProfiles/phs8916.html>
- National Institutes of Health (USA) has released a statement: "Effects and side effects of dental restorative materials. NIH Technol Assess Statement Online 1991 Aug 26-28.", which can be found at
<http://text.nlm.nih.gov/nih/ta/www/09.html>
- National Board of Health and Welfare, Stockholm, Sweden has released a summary of a report it produced 1994: "Possible Health Effects and Dental Amalgam-A scientific review from an expert group to the Swedish National Board of Health and Welfare", this summary can be found at:
<http://www.odont.lu.se/projects/NBHW/amalgam.html>

Other mercury / amalgam pages:

At a "Mercury page" maintained by Bo Walhjalt:

<http://vest.gu.se/~bosse/Mercury/default.html>

Bo writes:

"Here you will find information on mercury in nature, culture and mouth!"

Dental

WHO Collaborating Centre for Education, Training and Research in Oral Health, Faculty of Odontology, Lund University Sweden, has publicated some material on WWW:

<http://www.whocollab.odont.lu.se/index.html>

Here one, for example, can find caries-frequency in different countries.

Electromagnetic fields

There are some information on Internet about the potential health effects from electro-magnetic fields.

Some people who suspect having a (non-amalgam-) related illness also say that they do get increased symptom severeness in a highly electrified environment. Therefore the WWW-page from the Swedish organisation "FEB - The Swedish Association For the Electrically and VDT injured":

<http://www.feb.se/>

could be of interest for some. A newsgroup: bionet.emf-bio covers biological effects of EMF.

10.6 Patient organisations

Australia

Australian Society of Dental
Mercury Patients
Dianne White
PO Box 292 Deloraine
TA5 7304
TTAttatatkjfrhfrTatattatkjfhjs
gfjhrf
AUSTRALIA

Austria

Selbsthilfegruppe der
Behinderten für
Ganzheitsmedizin
Fidelia Heinrich M.D
Mail: Frau Martha Suran
Blindenheim "Harmonie"
Unterdambach
A-3052 St. Christopher
AUSTRIA
Tel/Fax: + 43 2 772152 9 52

Canada

DAMS Inc, Dental Amalgam
Mercury Syndrome
Cynthia Saville
44 Woodfern Drive S.W.
Calgary, ALBERTA T2W 4E4
CANADA
Tel +1 403 281-5900

Denmark

Foreningen Mod Skadeligt
Dentalmateriale.
(Danish Association
for Non-Toxic Dentistry.)
P.O. Box 203
DK-1501 Kobenhavn V
DENMARK
Tel: +45 3139 1560
Fax: +45 8613 3907

England

Society for the Campaign
Against Mercury (SCAM)
Sue Harris
62 Highfield Road
Rock Hill
Bromsgrove B61 7BD
Worcestershire
ENGLAND
Tel: +44 1527 570316

Finland

Suomen
Hammaspotilasyhdistys ry
(Organization for Oral Patients
in Finland)
Anja Olantera
PB 213
SF-00121 HELSINKI
FINLAND
Tel/Fax +358 9 607830

Germany

BBFU Bundesverband der
Beratungsstellen für
Umweltgifte,
insbesondere Amalgam,
Schwer-metalle
und Holzschutzmittel.
Manfred Klevers
Gorch-Fock-Str. 11
D-48527 NORDHORN
Tel/Fax +49 5921 35292

Holland

Amalgaam Vrij Nederland
Bo Baden
Postbus 23607
1100 EC Amsterdam Z.O.
HOLLAND
Tel/Fax +31 20 663 82 30
E-mail badenbo@xs4all.nl

Italy

Associazione Italiana Pazienti
Odontoiatrici
(I.D.P.O. Italian Dental Patient
Organization)
c/o Daniela Gonzo
Box 459
I-36061 Bassano (VI)
ITALY
Tel: + 39 424 525322
Tel/Fax +46 8 184086

Luxembourg

AKUT Aktionsgruppe für
Umwelttoxikologie
Jean Huss
2, Rue de la Boucherie
L-1214 LUXENBURG
Tel + 352 22 33 75
Fax + 352 22 28 73
email: info@akut.org
homepage:
<http://www.akut.org/>

New Zealand

DAMS NZ Incorp
Judy Tattersfield
Main Road
RD 9 Whangarei
NEW ZEALAND

Norway

Forbundet Tenner og Helse
(Norwegian Dental Patient
Organization)
Dagfinn Reyersol
Lovasveien 2
N-0870 OSLO
NORWAY
Tel +47 67 53 66 67
E-mail: mrygg@online.no

Sweden

Tandvardsskadeforbundet
(Swedish Association of
Dental Mercury
Patients)
Office:
Kungsgatan 29
S-461 30 Trollhättan
SWEDEN
Tel +46 0520-80 600
Fax +46 0520-80 602
E-mail: info@tf.nu
Information service:
Wolmar Yxkullsgatan 15B
S-118 50 STOCKHOLM
SWEDEN
Tel +46 8 641 90 81
Fax +46 8 640 15 44
Homepage: <http://www.tf.nu/>

Switzerland

Verein Amalgam-
Geschadigter
Jack R. Metz
Zahringerstr. 32
Postfach ZURICH
SWITZERLAND
Tel +41 1 252 5303
Fax +41 1 252 5358

USA

DAMS
(Dental Amalgam Mercury
Syndrome.)
Teresa Kaiser, MA
P.O. Box 64397
Virginia Beach, VA 23467
Tel: +1 800-311-6265
or Freya Koss
e-mail frekoss@aol.com

10.7 IAOMT

IAOMT (International Academy of Oral Medicine and Toxicology). The IAOMT membership consists entirely of dentists, physicians, scientists... or individuals with some other graduate degree. Associate membership is available to attorneys and related services. In the past the general public has been welcome at IAOMT International meetings but recently due to space limitations some restrictions on who may attend the scientific sessions have been applied. IAOMT stated in 1985 that they had reviewed the then available scientific literature and were unable to find any evidence of safety. IAOMT called for a ban on placement of amalgam until such time as the manufacturers, or proponents produced documented evidence of safety. IAOMT have not recommended that amalgams be removed yet. That is, according to IAOMT, due to the fact that careless removal will clearly expose everyone present to high levels of mercury. IAOMT have developed a protocol for the safer removal of amalgam which if followed exactly will dramatically reduce exposure.

From IAOMT Great Britain you can get a information package, for dentists and the general public, regarding mercury-related illness at the cost of 5 English pounds.

10.7.1 Addresses to IAOMT organisations World Wide

IAOMT international

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10.8 Dental associations

10.8.1 ADA

At the American Dental Association (ADA) [www-pages](http://www.ada.org) you have the possibility to search their pages (<http://www.ada.org/search.html>). (In March 1997 I got links to 40 ADA documents when I searched for: "mercury OR toxic". However it seems that this search-engine will only show the first 40 articles it finds, even if there are more articles fulfilling the search-criteria).

Dental organisations are often "pro-amalgam", the ADA in particular. Based on the lack of documentation behind their pro-amalgam arguments I requested that the American Dental Association provide scientific documentation to back up the statements / recommendations that is controversial:

As an example: "Dental Amalgam: 150 years of Safety and Effectiveness" from ADA NewsRelease (<http://www.ada.org/newsrel/1195/nr-02a.html>) (even put as an .pdf-file on my [www-pages](http://www.algonet.se/~leif/ada150am.pdf): <http://www.algonet.se/~leif/ada150am.pdf>)

ADA claims 1):

"... People are exposed to more total mercury from food, water and air than from the minuscule amounts of mercury vapor generated from amalgam fillings..."

This is highly controversial, (WHO 1991) and others, see section 7 in this FAQ for more references, reports that amalgam is the biggest source of mercury. This is far away from the emotional word “minuscule”. Here ADA should provide documentations or change their way of “informing”.

ADA claims 2)

“...dental amalgam... contains a mixture of metals such as silver, copper and tin, in addition to mercury, which chemically binds these components into a hard, stable and safe substance...”

This is highly controversial, ADA say that amalgam is stable. Stable should mean that mercury does not leave the fillings, but it does leave the fillings (Bjorkman 1992, Gay 1979, Langworth 1988, Skare 1994, WHO 1991...). And the word safe is controversial: DHHS (1993) says that “...health risks can not be totally ruled out because of the paucity of definite human studies... additional studies is needed to resolve the question of whether the mercury in dental amalgam poses any significant health risk to patients...” and NIH (1992) says that: “... Lack of reliable quantitative estimates of the risks and benefits of the various dental materials discussed at this conference precludes calculation of benefit/risk ratios. The paucity of data concerning predictable risks associated with restorative dental materials was striking...”. Here ADA should provide documentation or change their way of “informing”.

ADA claims 3)

“... Used for more than 150 years, dental amalgam (a.k.a. silver filling) is a safe...”

This is highly controversial. If this way of “proving” what was safe were to be used in medical areas it would set a new standard for what is to be looked upon as safe. For me it more shows the “...the paucity of definite human studies...” when ADA has to use such an argument instead of provide scientific documentation to back up their statement. Here ADA should provide documentation or change their way of “informing”.

When reading material from any source, ADA in special, always ask for scientific documentation!

Address to ADA is:

<http://www.ada.org/index.html>

10.8.2 BDA

The British Dental Association has WWW-pages (<http://www.bda-dentistry.org.uk>), where I found one article “Amalgam facts” (<http://www.bda-dentistry.org.uk/factfile/fact04.html>) in the area of amalgam illness (even put as a pdf-file on my own pages: <http://www.algonet.se/~leif/bdafactf.pdf>). (I looked in March 1997) Quote from that document:

“Whether amalgam can be called ‘safe’ is a matter for manufacturers of amalgam and for the Department of Health, and for the toxicologists and other scientists who advise them. Dentists comment on the dental properties of the material.”

And all the same they comment in the same document in a way that is highly controversial and could be taken as amalgam were proven to be safe:

“The amount of mercury which reaches the rest of the body is very small and its relationship to the number of teeth with amalgam fillings is unclear.”

They use words like very small when amalgam is reported to be the populations biggest source of mercury (WHO 91), this without even giving a reference to back it up with. Their opinion that the relationship to the number of teeth with amalgam fillings is unclear is controversial especially as they provide no scientific documents to back their beliefs up. I myself here provide a couple of quotes from scientific documents to back up my position that the BDAs believe is controversial at least:

- Drasch (1992) writes: “...The number of teeth with amalgam fillings shows a strong correlation to the Hg-concentrations in all investigated tissues...”
- Elleingsen (1993) writes “...A significant relation between the surface of dental amalgam and U-Hg (Pearson’s $r = 0.63$, $p < 0.001$) was found...”

10.9 Addresses to foundations that financiate science in the mercury / amalgam / health -fields

The one foundation I know about, besides those belonging to other organisation mentioned in this FAQ, is:

International Metal Biology Foundation (Amalgamskedefonden)

Axel Johanssons gata 4

S-754 51, UPPSALA

SWEDEN.

Tel + 46 18 15 55 00

Fax + 46 18 15 55 01

E-mail: info@amalgamskedefonden.se

WWW: <http://www.amalgamskedefonden.se/>

Bankgiro: 900 - 7659 (In Sweden only)

Postgironumber: 90 07 65-9 (In Sweden only)

10.10 Commercial products / firms.

Clean Up

“Clean Up”, an suction handle / nozzle that encloses the tooth on all sides but the chewing side. It costs (in Sweden) under USD 3, it is manufactured and marketed by:

AGDA-gruppen AB

P.O. Box 124

S-794 22 ORSA

SWEDEN

Phone +46 250 430 27

Fax +46 250 430 28

Clean up is also sold by Bio-Probe from their homepage:

<http://www.eyec.com/bioprobe>

DentoDafe

”DentoSafe”, is a mercury-capturing system for dental offices that consists of two parts; first a hands free air suction device that is placed over and a bit from the patients mouth and second a selenium filter that can be connected to the (preferably an extra) vacuum system.

Reseller

Brage Nilsson D.D.S

Box 33

S-941 21 Pitea

SWEDEN

Tel +46 (911) 158 55

Fax +46 (911) 171 35

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