

EFFECTS OF AMALGAM REMOVAL ON HEALTH

25 studies comprising 5821 patients

Mats Hanson

Tandvårdsskadeförbundet, Tf;
Swedish Association of Dental
Mercury Patients, 2004

Introduction

The Swedish Association of Dental Mercury Patients (Tf) started the more systematic investigation of symptoms related to amalgam and the effects replacing the alloy with less toxic materials (Tf-bladet, 1986). Since then a considerable number of studies of varying quality have been presented, most of them by dentists. Most of them give a very consistent result: there is hardly any medical treatment which gives so positive results on so many health problems as amalgam removal.

Amalgam is a mixture of mercury and other metals (usually silver, tin, copper and sometimes zinc) and all metals are released by the fillings and are absorbed by the body. In addition, many persons are exposed to metals from other types of restorations, e.g. gold, platinum, palladium in pharmacologically relevant doses. "Amalgam poisoning" is therefore not quite equivalent with mercury poisoning. Many metals have similar biological effects and although mercury is the most poisonous of the dental metals, each one might have specific effects. However, treatment of most poisonings follow the same rule: elimination of exposure and addition of antidotes, nowadays often in the form of antioxidants.

Comments on the various studies

No study can pass without objections. Criticism can be raised against selection of patients (self-selected), frequency of replies to questionnaires, variations in symptoms reporting, follow-up time, uncertainty about materials replaced (amalgam, gold alloys, gold + amalgam, metal-bound porcelain etc.), replacement materials, precautions during amalgam removal, rate of

removal, dental cheating (amalgam remaining under plastics).

Some studies have overlapping patient material and especially the Swedish studies have more or less comprised members of the Swedish patient organisation, however, during a period of 16 years with a considerable turnover of members. Some studies have reported the state of health for all patients collectively in various phases of exchange, ongoing or at varying times after amalgam removal. Other studies have divided the patients into groups with completely removed amalgam, partly removed and controls without any exchange at all.

There is rarely any information on new treatments initiated in connection with amalgam removal. Especially have many patients started with antioxidant therapy as a new form of treatment, whereas conventional medical treatments do not appear to have had any remarkable effects and are not different from treatments which have been ineffective for years.

Even if some information is lacking in each study, the various investigations from different parts of the world complement each other and information lacking in one study is provided by other studies, however from other patients.

Sex, age.

Most of the patients are women, something which influences how they are treated in the health care system (negative influence). The mean percentage of women in the total of all studies is 71 %, most of them within the age range 40-60 years.

Patient selection

The reason these patients visit the dentist is to have amalgam removed. A minority of patients remove amalgam to reduce the risk of future problems, for the unpleasant feeling of having a load of poison in the mouth, for aesthetic or environmental reasons. One study has monitored health changes also in the group of persons that considered themselves healthy before amalgam removal (Eriksson et al, 2000). Often the removal of amalgam is a final, unpleasant and expensive measure after many years of ill health where conventional medical therapies have not improved the situation. In at least one study (Klock et al, 1989) patients with "other causes"

(according to the dentists judgement) for their problems have been excluded beforehand. One study (Hugosson, 1986) excluded nearly all the patients for this reason, but these, symptom descriptions and treatments are so poorly described that the study had to be excluded from the current meta-analysis.

Several studies that have tried to relate symptoms to levels of Hg in blood and urine. These have been excluded from this analysis since none has provided any correlations. This is completely consistent with the experience from the acrodynia epidemic and more recent reports. There is no relation between symptom severity and levels of Hg in blood or urine. Individual sensitivity is more important.

Replies to questionnaires

The result might be affected if patients with improved health answer questionnaires more frequently than persons where amalgam removal has been without effect. Some studies have, by using telephone interviews and reminders, tried to estimate such effects. In the study by the Swedish patients organization, Tf, from 1986, the percentage of replies was low (519 replies on a questionnaire sent out in the patient organization bulletin, the membership then about 3-4000). Mörnstad et al sent a questionnaire to members of Tf in Västerbotten County 1990 and obtained 62 % replies. The result was the same as in 1986, which indicates that no systematic skewed reporting had taken place, even when the frequency of replies was low.

Other studies with the same degree of health improvement have reached a higher response rate. Lindfors et al, 1994 had a 72 % response, Östlin, 1991 80 %, Strömberg and Langworth, 1998 78 %, including a follow-up of non-respondents by telephone interviews. The pattern of replies and results from those answering by telephone did not differ from those sending in written reports. Klock et al, 1989 reported 80 % replies; in a follow-up study 1992 67 %. Some persons did not want to reply since they disliked the conclusion from the first study that the health improvements were caused by a placebo effect. Lindh et al, 2002, 65 %. A follow-up of those not answering did not show any change. In a study by Sjöblom, 1990, 86 of 300 patients replied (29 %).

Thus, we have not the impression that persons who answer these questionnaires constitute a group which is enriched with patients who have improved after amalgam removal and that the reported results might give a too optimistic view. On the contrary, persons who have recovered leave the organization after some years, more so than persons with remaining problems or recovering who want information on possible treatments that can enhance the process.

Reporting symptoms

The questions regarding symptoms have varied. In the 1986 Hanson study we asked for the 10 worst symptoms. In other studies a list of symptoms has been presented to the patients, symptoms the investigator considered belonging to the amalgam syndrome. The list can be very long or only comprise a few symptoms. Questions on both symptom frequency and intensity occur. Frequency is of less interest since you can live with minor problems but if they get intense the patients will try to get help from the health care system.

The study by Hanson, 1986, has influenced later studies regarding which symptoms are connected with amalgam. The study also lists symptoms of inorganic mercury exposure from a number of studies, not connected with amalgam. All amalgam symptoms can be found in the latter. The questionnaire used in Hanson, 1986, had no clues or directives on what to expect. At that time the general knowledge of amalgam poisoning was less than today. Irrespective of the type of questionnaire some symptoms are constantly reported.

The type of questioning has some bearing on the issue of which symptoms appear first. From the studies where the patients indicated their problems in a list it appears that psychic/cognitive effects are the first to appear and that after longer and more intense exposure tiredness, pains etc dominate.

Symptoms

Most studies report many and varied symptoms. Some of these appear constantly. A compilation of symptoms from all studies according to frequency shows the following: (only the most common ones included): Fatigue, anxiety/depression, muscle pains, headache, concentration problems, joint problems, metal

taste, mouth symptoms, vertigo/dizziness, gastrointestinal problems, memory disturbances, problems with sight, irritability, sleep disturbances, heart problems, skin problems, allergies, problems with hearing, numbness, infection prone.

Changes in health

Health changes after amalgam removal (much better or better) in the studies which give possibility for percentual calculations: 94; 78; 88; 76; 80; 80; 40; 70; 68; 88; 79; 68; 31; 71; 70; 79; 60; 89; 88; 63; 72; Mean 73 % See diagram for each study.

Incomplete removal.

In some studies patients who have not or only partly removed amalgam been documented separately. Lindfors et al, 1994, obtained much better or better in 88 % of the cases when all amalgam fillings had been removed, compared to 54 % with partial removal and 39 % when no fillings had been exchanged.

Östlin, 1991, 91 % after complete exchange and 46 % after partial exchange; Olsson & Lindh 75-80 % after total and 38 % after partial or no exchange. Strömberg & Langworth 80 % and 61 % respectively.

In Bjerner & Hjelm, 1991, only 1/3 had removed all amalgam. Total exchange increased joint- and muscle pains, general weakness, concentration problems, memory disturbances, and dry mouth. Metal taste, tremor, headache were reduced. The same data a year earlier, presented to the Health and Welfare Board (SoS) "heavy metal group", gave results, which were generally the reverse. At that time (1-year follow-up) 142 patients had been evaluated and 1/4 removed all amalgam fillings, later, when the 1-year follow-up had been completed, 207. At the 2-year follow-up 98 patients were contacted. If these were patients which had participated in the earlier follow-up is not stated. The number of patients described had thus increased with 65 and 1/3 had exchanged all amalgam fillings. Tf has the information that at the visit to the referral dentist and doctor no information on amalgam beneath gold crowns and bridges was given. Neither was any information presented on possible materials, which could be used instead of amalgam. In addition the responsible dentist and doctor gave several lectures to the county dentists with the message that you cannot get ill from amalgam.

The Bjerner & Hjelm report deviates markedly from the results of other studies.

Klock et al, 1989, reported 70 % improvement in those with complete removal and 17 % in those with partial removal or other treatments. The follow-up showed 68 and 44 % improvement respectively.

Lichtenberg, 1996, reports that nearly 1/3 (39 of 118) patients had remaining gold or porcelain after visible amalgam had been removed. Under such restorations amalgam might remain. The result was 79 % healthy or better when visible amalgam had been removed. The explanation is certainly that patients hesitate to remove expensive constructions when also the replacements can be expected to be expensive. The same conditions should be applicable to most studies. Eriksson et al, 2000, report that 30-40 % of the patients, before starting exchange, had other metals in their mouths. After amalgam removal and dental work 10-15 % of the patients had remaining other metals.

What and how much has been removed?

Amalgam is certainly the most common material which is removed. However, nobody has systematically examined how carefully the alloy has been removed. Our experience during 20 years has shown that dentists often cheat; all amalgam is not removed but only part of it and the rest is covered with composite plastics. The patients will often first become better but gradually the symptoms recur. Amalgam is regularly present beneath gold-crowns and -bridges and gold-amalgam contacts are often the worst causes of ill health. There are also brass screw posts with a thin and porous gold plating, often directly cemented into amalgam fillings. Such constructions often result in periapical inflammations.

Metal fused to porcelain contains, in addition to the noble metals, undeclared additions of easily oxidized metals, added to obtain a good fusion between the components. Constructions of metal fused to porcelain give as many health disturbances as amalgam. Endodontically treated teeth contain, in addition to root screws of various metals (sometimes even pieces of paper clips!), not uncommonly broken-off root files, endodontic filling materials containing everything

possible poisonous. It is not just the infamous N2, which is a hazard to health.

A thorough sanitation should, logically, include removal of everything which is suspect and as innocuous materials as possible be used instead. Few dentists work without neglecting some of these principles.

Reactions during removal

Hanson, 1986 reports 113 short acute patient reactions (from 519 patients) during the period of amalgam removal (Spontaneous patient reports, not included in questionnaire). Strömberg & Langworth, 1998, reported that 1-2 fillings were removed every month with the use of high volume vacuum and cofferdam whenever possible. Despite this, reactions following amalgam removal were common. Out of the 26 patients who replied to this question, 46 % reported increased health problems after each amalgam removal session, 33 % sometimes and 21 % never. A majority of those who experienced problems (93 %) the symptoms appeared within 6 days, 7 % after a week or more. Most patients (59 %) noticed an intensification of symptoms already present, but 41 % had quite new symptoms. The intensification usually lasted for 2-6 days or more.

Bjerner & Hjelm, 1991, reported that 75 % had no unpleasant effects in addition to those which are normally connected with reparative dentistry, 13 % experienced symptoms the same day, 8 % 2-3 days later and 2 % >3 days. Mörnstad et al, 1994, however, reported 79 % negative health effects in connection with amalgam removal, usually after 2 days (0-20) and remained in the mean 4 weeks (0 days to several months). 10 % of the group reported no reaction at all.

Eriksson et al, 2000, write that 39 % of all patients in the study felt worse or much worse after drilling out amalgam. Persons who considered themselves sick from amalgam felt worse to 56 %. Persons who removed amalgam for other reasons reacted much less frequently. Hovmand, 1987, writes that some patients had unpleasant reactions in connection with amalgam removal but that this group later showed the most pronounced health improvements. The temporary reactions were typically acute attacks of already existing symptoms.

Follow-up

The idea that health improvements after amalgam removal should be caused by a placebo effect (if such even exists) has been proposed by e.g. Klock et al. Also "placebo-believers" consider such effects short-lasting. A number of the studies have evaluated the patients a long time after amalgam removal.

Olsson & Lindh, 1997, followed the patients in different groups up to 10 years. Changes appearing in the 0-3 year group did not differ from those in the 3-5 group and 3-10 year group (different patients).

Strömberg & Langworth, 1998: 14 % of the patients reported improvements starting within 1-2 months after removal of amalgam had been finished, 46 % successive improvement starting within 6 months. For 40 % the improvement came after more than 6 months, not indicating a placebo effect.

Klock et al evaluated 1/2 - 1 year after the time of examination. Continuing evaluation 42 months later. The results were persistent. The group with no removal or other treatment had also improved but not to the same degree (68 % am. removal and 44 no removal). Lichtenberg, 1993, evaluation 1 year after amalgam removal was finished and Lichtenberg, 1996, 1-4 years.

Redhe evaluated 3 years 11 months after removal. In the study by Eriksson, Falk, Liukkonen, 2000, the patients reported 0-15 years after removal. 11 % were then still in the process of removal. Of those under treatment 20 % had experienced improvement; of those who had finished the treatment 1 year or more ago 70 %. Engel evaluated a mean 16 months after treatment (0-116), Hovmand: mostly 6-12 months and Zamm mostly 4-12 months.

Period of ill health

The results from studies reporting duration of illness regularly indicate several years. In Hanson, 1986, those who reported better/much better health had been ill for a mean of 13 years; patients who got worse 23 years. Other studies report a mean of 10,3 years; >6 years, 14-15 years, mostly 5-20 years; >2 years and about 35 % 4 up to more than 10 years, 20 % 1-4 years.

DAMS/ Foundation for Toxic-free

Dentistry, USA

Patient Adverse Reaction Report, 1993

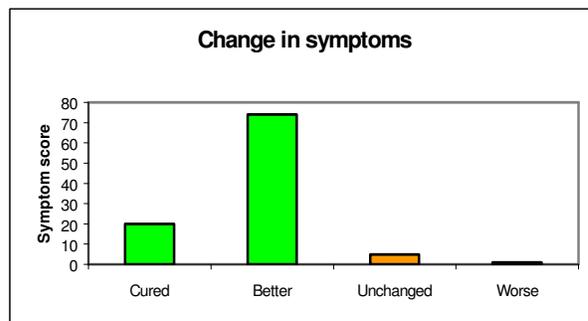
762 patients

534 women, mean age 45 y.

228 men, mean age 46 y.

Common symptoms: Depression, allergies, exhaustion, lack of energy, headache, loss of memory, metal taste, gastrointestinal problems, vertigo/dizziness, irritability, sleep disturbances, joint problems, difficult concentrate, muscle weakness and pains, nervousness, numbness, hearing problems, vision problems, skin problems, multiple sclerosis.

Published by DAMS, sept. 1993



Hanson, 1986

519 patients

Estimate of health status after amalgam removal. Changes in 62 symptoms, reported 3319 times in 519 patients

The 10 most troublesome symptoms were reported. It is very little difference between a health score based on individual symptoms and a general estimate of health.

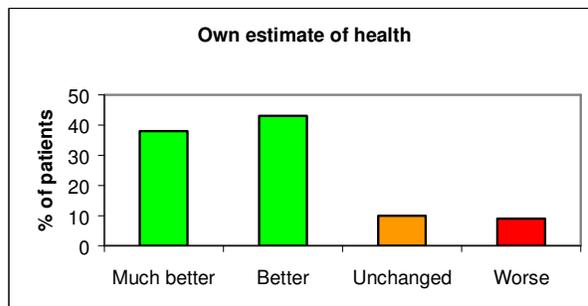
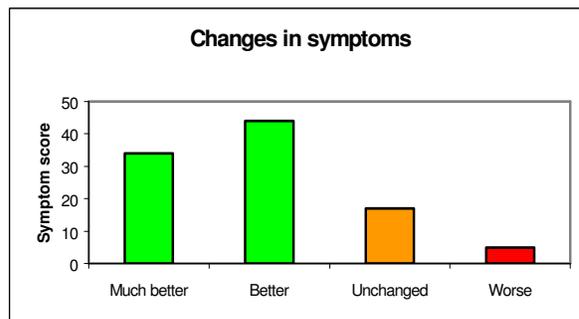
379 women, 136 men. Not reported 4.

Mean age women 51 (12-78) y.

Mean age men 47 (18-79) y.

Most troublesome symptoms: Joint and muscle pains, tiredness, vertigo, headache, gastrointestinal problems, problems with vision, mouth problems, heart trouble, loss of memory, problems with breathing/asthma, ear problems, depression, concentration difficulties.

Hanson, M. Tj-bladet 1, 1986 (Bulletin of the Association of Swedish Dental Mercury Patients)



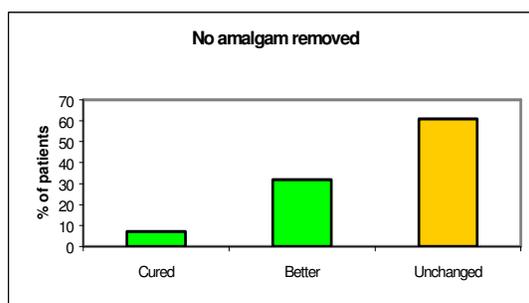
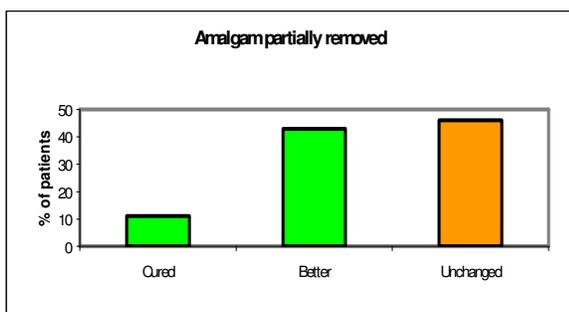
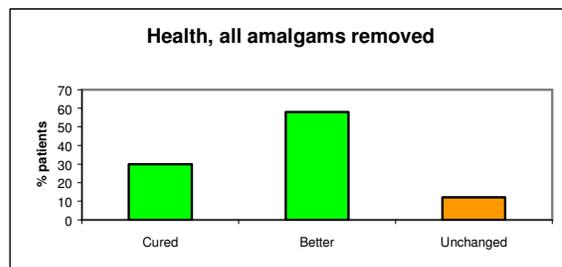
Lindforss et al, 1994

503 patients

72 % women, 28 % men, the majority 40-60 y.
Several symptoms increased in frequency but reduced in intensity.

Common symptoms: Pains, tiredness, anxiety, vision disturbance, disrupted sleep, metal taste, dry mouth, oral smarting pains.

Lindforss, H, Marqvardsen, O, Olsson, S, Henningsson, M. Effekter på hälsan efter avlägsnandet av amalgamfyllningar (Effects on health after removal of amalgam fillings) Tandläkartidn. 86(4), 1994, 205-211.

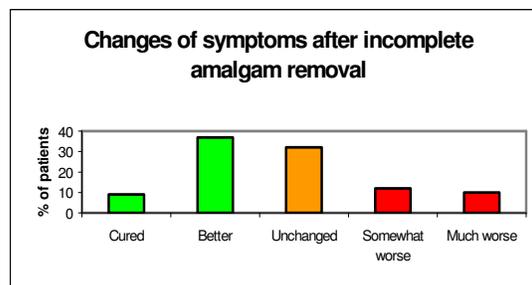
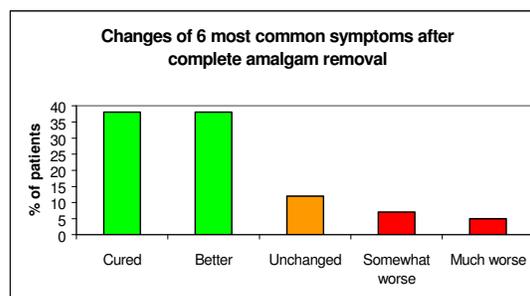


Försäkringskassan (Stockholm health insurance), Stockholm, L. Östlin, 1991 308 patients

Diagram based on changes in symptoms for the 6 most common symptoms. Other symptoms showed the same tendency to varying degrees.
74 % women, 26 % men, mostly 40-59 år.
73 % had exchanged all amalgam fillings, the rest in various stages of removal.

Common symptoms: Blisters and ulcers in the mouth, smarting/metal taste, tiredness, muscle pains, headache, tooth- & jaw pains, joint pains, problems concentrating, vertigo, gastrointestinal problems, shoulder pains, anxiety /restlessness/ depression, skin affections, vision disturbances, heart problems, and tinnitus.

Östlin, L. Amalgamutbyte - en väg mot bättre hälsa? (Amalgam removal - a road to better health?) Försäkringskassan, Stockholms län, 1991



Olsson & Lindh, 1997
253 patients in 4 groups

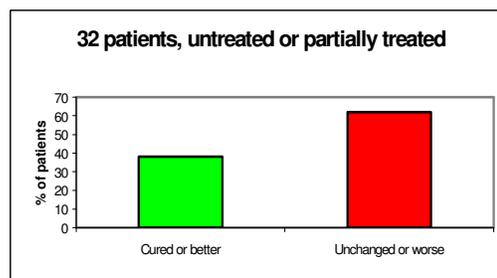
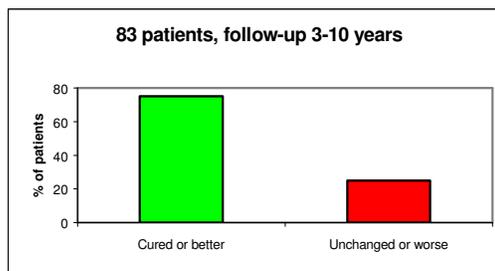
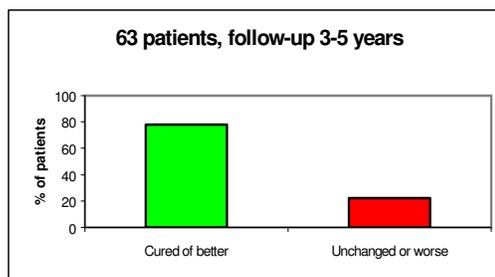
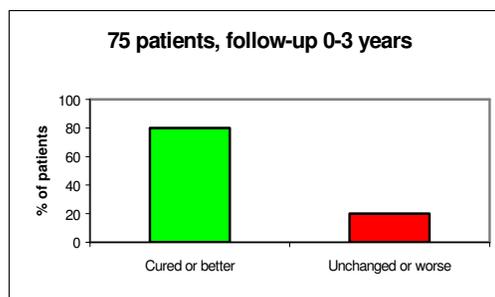
Based on % changes of 13 symptoms

Group IV comprises patients who have started amalgam removal but not completed (59 %) and patients who never started (41 %)

Most frequent symptoms: Pronounced tiredness, oral mucosal smarting & metal taste, difficulty concentrating, headache, muscle pains, anxiety, restlessness and depression, joint pains, shoulder pains, gastrointestinal disturbances, tooth & jaw pains, blisters & ulcers in oral mucosa, heart problems, skin eruptions, vertigo, infection prone, and visual disturbances.

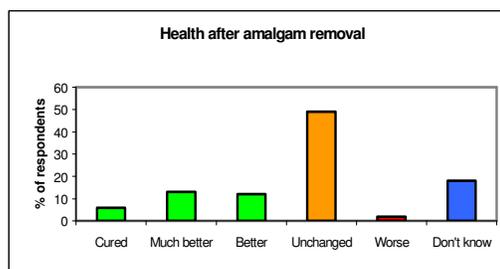
Oral smarting and metal taste improved in 87 % of patients who had removed amalgam; in 48 % of patients who had only partially or not at all removed their amalgam fillings.

Olsson, G & Lindh, U. Veränderung des allgemeinen Gesundheitszustand nach Amalgamentfernung. (Changes in general health after amalgam removal) GZM, Ganzheitl. Zahnmed. 2(1), 1997, 22-28.



SIFO, telephone questionnaire, 1993
100 patients (opinion poll institute)

SIFO: Allmänhetens inställning till och besvär av tandfyllningar med amalgam., (Attitudes and problems from amalgam dental fillings in the general population) Södelind, M. SIFO Research AB, 1993. Comment: There is no information on completeness of amalgam removal or how well the respondents understood the question (M.H.)



Strömberg & Langworth, 1998

233 patients

No significant difference between 0-1 y. and >6 y. follow-up.

31 % men

69 % women

36 out of 280 were initially convinced that their problems were amalgam-related.

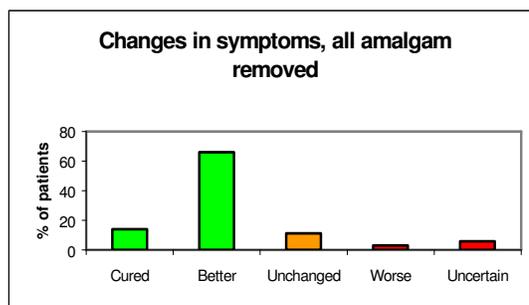
The development of symptoms up to start of amalgam removal was a successive increase in 78 % , in 18 % unchanged and in 4 % abating. The duration of symptoms a mean of 10,3 years.

Common symptoms: headache, tiredness, vertigo, difficult concentrating, oral smart, changes of taste, recurrent respiratory infections, and gastrointestinal problems.

Strömberg, R, Langworth, S. Förbättras hälsan efter borttagning av amalgam? (Does health improve after removal of amalgam?)

Tandläkartidn. 90(9), 1998, 23-29.

general weakness, problems concentrating, shyness,



207 patients

Bjerner & Hjelm, dec. 1991

207 patients

72 % women, 28 % men, mean age 48 y.

Follow-up 1 y. after first visit.

36,1 % had exchanged all amalgam (75 %), 27,4 % none, 19,2 % a few, 17,3 % many..

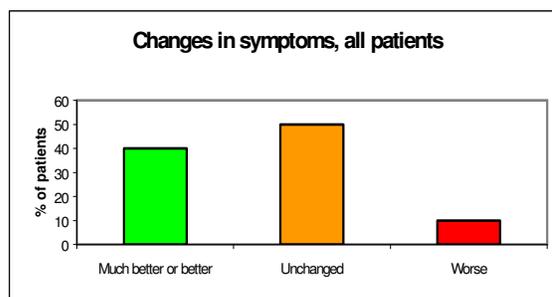
Common symptoms: Headache, metal taste, vertigo, difficulty concentrating, joint and muscle pains, numbness, general weakness, parenthesis, sweating, loss of sleep.

Most symptoms have lasted >6 years

Metal taste and headache had diminished after amalgam removal.

Joint and muscle pain, general weakness, difficulty concentrating, memory impairment and dry mouth had increased, based on 74 of 207 pat. who had removed amalgam

When the same data, but with fewer patients followed-up, 37 of 146 who had removed amalgam, were presented for the Health and Welfare "Heavy Metal Group" one year earlier (November 1990), joint and muscle pains,



memory impairment and metal taste had diminished and salivation and gingivitis increased after amalgam removal.

LEK-studien, Landstinget Dalarna, Bjerner, B & Hjelm, H. dec. 1991

LEK-studien Dalarna. Sammanställning inför hearing med SoS:s "tungmetallgrupp", 90-11-21

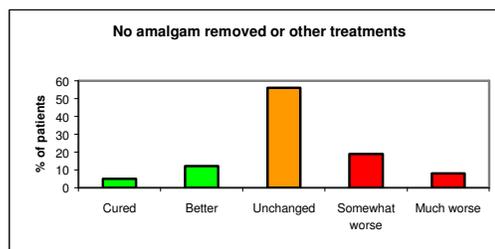
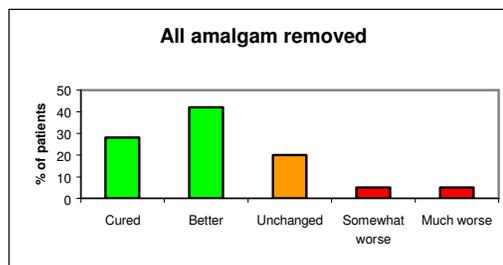
Klock, Blomgren, Ripa, Andrup, 1989 198 patients

Based on 6 most common symptoms: tiredness, smarting and metal taste, difficulty concentrating, muscle pains, anxiety/restlessness/depression, and headache. Evaluation 1/2-3 y. after examination by referral dentist.

Other symptoms showed the same improvement after amalgam removal.

The authors are of the opinion that the patient's symptoms do not belong to those which should occur at light mercury poisoning (hand tremor, loss of appetite, loss of weight according to the authors) and that it must be a placebo effect since all, widely varying symptoms, were reduced after a single form of therapy.

Klock, B, Blomgren, J, Ripa, U, Andrup B. Effekt av amalgamavlägsnande på patienter som misstänker att de lider eller har lidit av amalgamförgiftning. (Effect of amalgam removal in patients who suspect amalgam poisoning) Tandläkartidningen 81, 1989, 1297-1302.



Klock & Ripa, 1992, follow-up 166 patients

Klock, B, Ripa, U. Effekt av amalgamavlägsnande på patienter som undersökts av hänvisningstandläkare. (Effect of amalgam removal in patients, examined by referral dentists) Tandläkartidningen 84(17), 1992, 988-994.

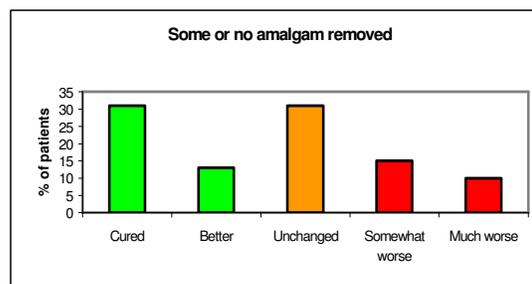
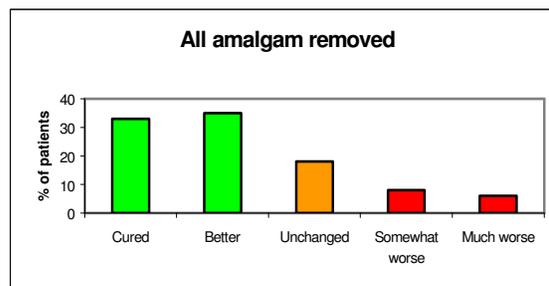
All amalgam removed, n = 102

Some amalgam removed: n = 43

No amalgam removed or other treatments:

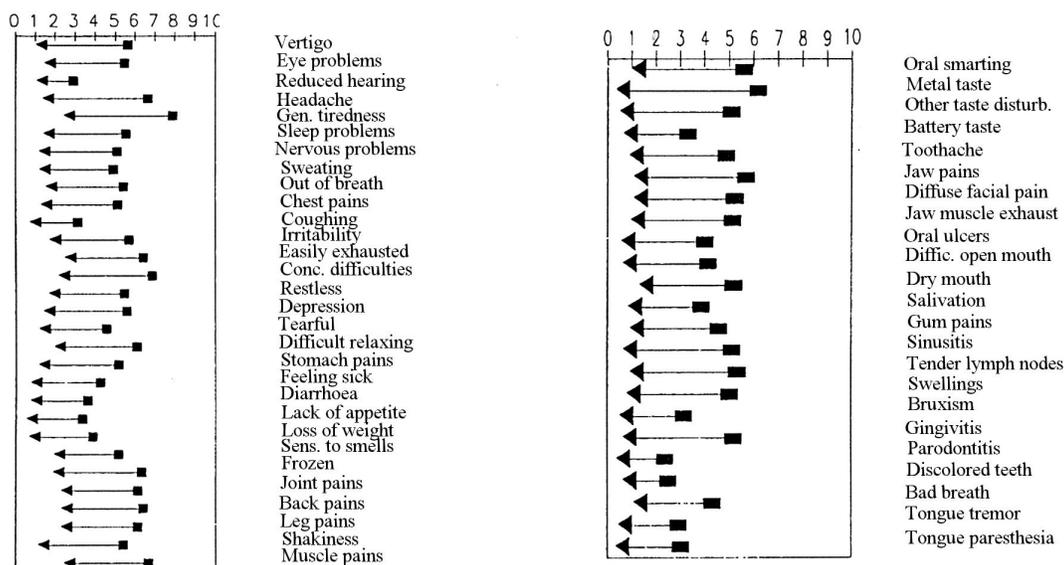
N = 14

“Other treatments” not specified.



Mörnstad, Teivens, Wänman, 1994

132 patients



Questionnaire to members of patient organization (Tf) in Västerbotten County. 159 had completely removed amalgam and out of these 132 had adequately replied.

Common symptoms (most severe symptoms): muscle pains, joint pains, general tiredness, headache, back pain, shoulder pain, vertigo, gastric pain, heart trouble, tinnitus, chest pains, temporomandibular pains, problems concentration, sleep disturbances mm.

Amalgam removal had most effect on general tiredness (7,9 -->2,8), headache (6,6 -->1,8), vertigo (5,5 --> 1,3), difficulties concentrating (6,7 -->2,5) and feeling frozen (6,4 -->2,2). Depending on symptom between 14 and 34 out of 132 reported that they had completely got rid of the symptoms. Total resolution of symptoms was most often reported for vertigo (34), eye troubles (31), headache (27) and sleep disturbances (27). One person reported that all earlier symptoms had completely disappeared after amalgam removal.

Most common mouth symptoms were metal taste, oral smarting, jaw pain and easily exhausted jaw muscles. Most effect of amalgam removal was found for metal taste (5,7 -->0,9), jaw pain (5,3 -->1,3), sinusitis (4,9 -->1,0),

diffuse facial pain (5,0 -->1,3) and oral smarting 5,3 -->1,6). 79 % had reactions directly in connection with amalgam removal, most often after 2 days (0-20) and remaining a mean of 4 weeks.

46 % considered that they had been badly treated in the health care system, 12 % well treated, and the rest neither well nor badly. Most of the patients were living in the Skellefteå community, a mining area where Rönnskärsverken is situated, earlier the largest point source of mercury release in Sweden.

Mörnstad H, Teivens A, Wänman A. Sjukdomsbild och attityder till amalgam. En enkätstudie bland medlemmar i Tandvårdsskadeförbundet. (Health status and attitudes to amalgam. A questionnaire to members of the Dental Patient Organization) Tandläkartidningen 86, 1994, 196-204.

Lichtenberg, 1993 120 patients

120 patients, 97 women, 23 men, mean age 48 years (25-72)

Adequate protection during amalgam removal. Replacement material composite plastics. Evaluation 1 y. after completed amalgam removal.

% change in symptoms in patients who before amalgam removal had a specific symptom. Variation 75-100 %.

100% elimination for tender teeth (reported by 62 pat.), metal taste (69 pat.), lack of appetite (12 pat.).

Continued evaluation shows a transfer from group improvement to group elimination of symptoms.

Common symptoms: Joint pains, leg cramps, exhaustion, easily tired muscles, headache, metal taste, bleeding gums, tender teeth, irritability, difficulty concentrating, vertigo.

Lichtenberg H. Eliminating of symptoms by removal of dental amalgam from mercury poisoned patients, as compared with a control group of average patients. *J. Orthomol Med.* 8, 1993, 145-148

Lichtenberg, 1996 110 patients

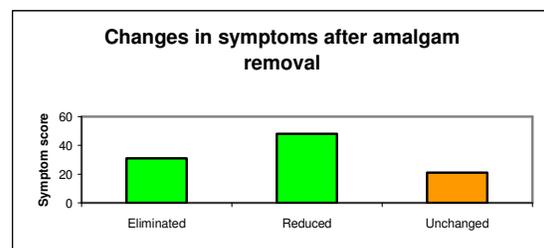
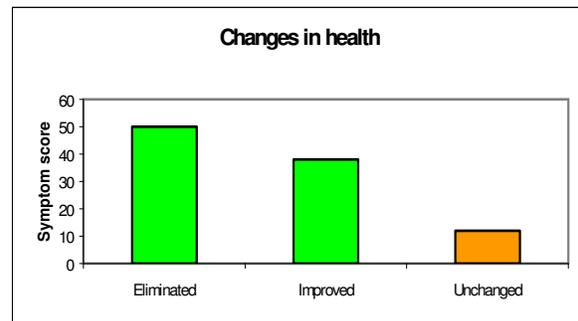
79 of the patients had no metals remaining after treatment, 39 had remaining gold or porcelain beneath which there might have been amalgam remaining.

Follow-up 1-4 years

Common symptoms: Tiredness, difficulty concentrating, bad memory, irritability, muscle weakness, metal taste, headache, joint pains, throat pains, bloating, allergies, bad appetite.

Metal taste was present in 72 patients before treatment, after am. removal eliminated in 59 and reduced in 12.

Lichtenberg, H. Symptoms before and after proper amalgam removal in relation to serum-globulin reaction to metals. *J Orthomol Medicine* 11(4), 1996, 195-204.



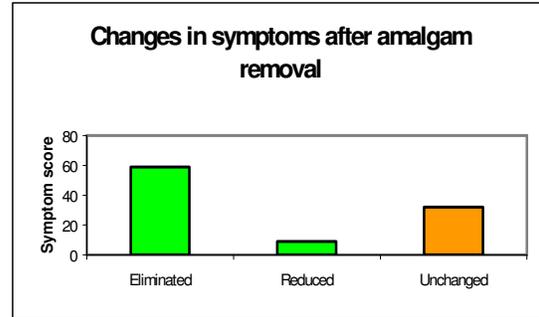
Redhe, 1991 100 patients

Follow-up 3 y. 11 mo.

71 women, 35 men (drop-out 6 persons before completion of study)

Common symptoms: Headache, tender teeth/tooth ache, strained jaws, tiredness, vertigo, joint and muscle problems, anxiety/restlessness/stress feeling, metal taste, recurrent infections.

Sjuk av amalgam. (Sick from amalgam) Redhe, O. R-Dental, Falun, 1991



Eriksson, 1996 97 patients

64 women

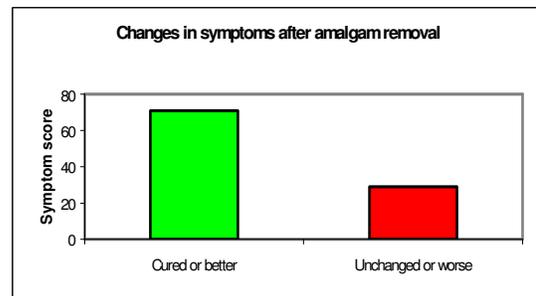
33 men

Follow-up > 3 years

Common symptoms: General tiredness, feelings of stress and tension, back/neck pains, joint pains and problems, metal taste, stiffness of joints and muscles, vertigo, forgetfulness, headache/migraine, muscle pains.

Metal taste remained in 2 of 62 patients

G. Eriksson, Torsås. Amalgamsanering - kliniska resultat efter tre år. (Amalgam removal - clinical results after three years) IAOMT, 1996

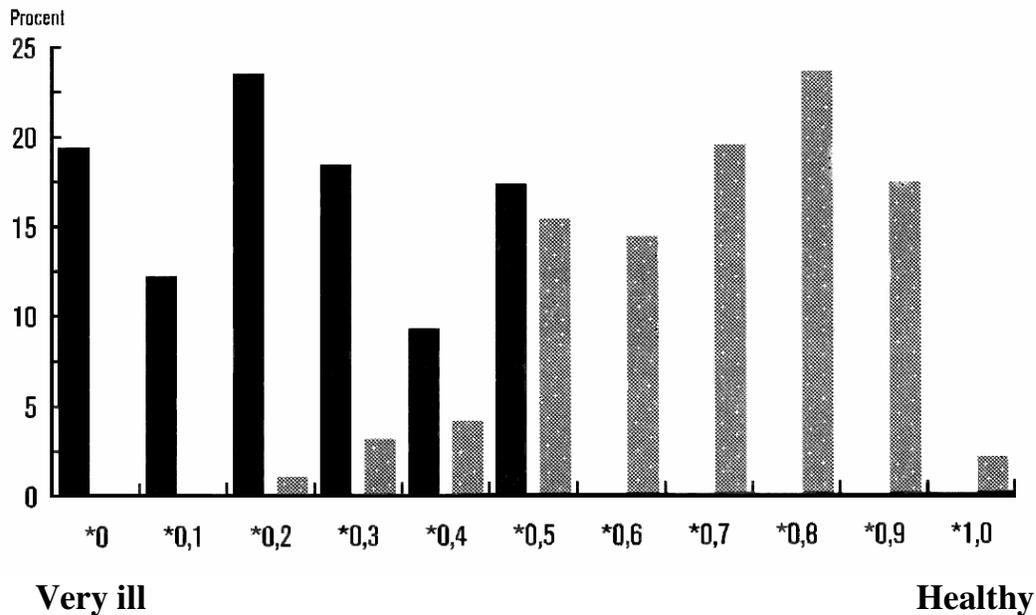


Eriksson, Falk, Liukkonen, 2000
98 patients

Changes in health after amalgam removal

Black: Category scaling before amalgam removal

Shaded: Category scaling after amalgam removal



98 patients. Questionnaire to patients to dentists, which by Tf had been judged to remove amalgam in an adequate way, using replacement materials, which most patients, tolerate.

Most common symptoms: Joint and muscle pains, memory disturbances, headache, difficulty concentrating, irritability, sensitivity to light/sound, pains/sensitivity in teeth, sleep disturbances, paralysing tiredness, anxiety, skin problems, allergies.

Eriksson, L. Amalgam, hälsa och pengar. (Amalgam, health and money) Falktext, Växjö 2000.

Siblerud, 1990

86 patients

The total number of symptoms 1815 in a questionnaire where the patients indicated their symptoms from a list and reported degree of change.

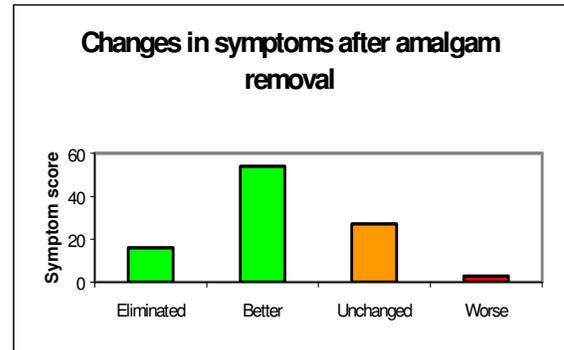
80 % reported feeling better. The degree of health improvement 59 %

91 % were satisfied with the decision to remove amalgam and 88 % that they should do it again with the result of the removal as a decision basis.

32 patients reported metal taste. Disappeared or reduced in 30, 1 unchanged, 1 worse.

Most common symptoms: Depression, irritability, forgetfulness/memory loss, difficulty concentrating, metal taste, vision disturbances, easily exhausted, fatigue, tired in the morning, gastrointestinal problems, hypoglycaemia, anger easily, depression, irritability, often restless, nervousness, low self esteem, sensitive to foods, sensitive to light (eyes), cold hands and feet, vertigo/dizziness, sleep disturbances.

Siblerud, RL. Health effects after dental amalgam removal. *J. Orthomol. Med.* 5, 1990, 95-106.



Godfrey & Campbell, 1994

80 patients

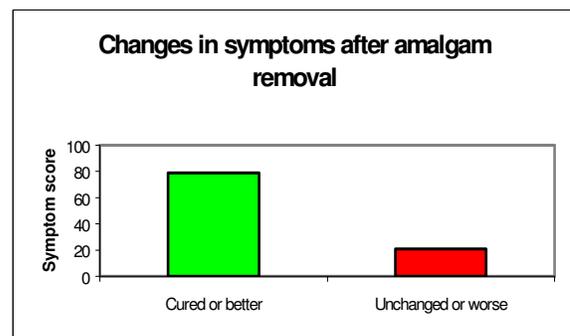
Women 48

Men 32

Mean age 43 y. (19-71)

Most common symptoms or symptom groups: Tiredness, neurological, psychological, gastrointestinal problems. Bad memory, metal taste, headache, cold extremities, tinnitus. Metal taste was present in 59 of 80 patients. After amalgam removal none.

Godfrey, M. & Campbell, N. Confirmation of mercury retention and toxicity using 2,3-dimercapto-1-propane-sulphonic acid sodium salt (DMPS). *J. Adv. Med.* 7(1), 1994, 19-30.

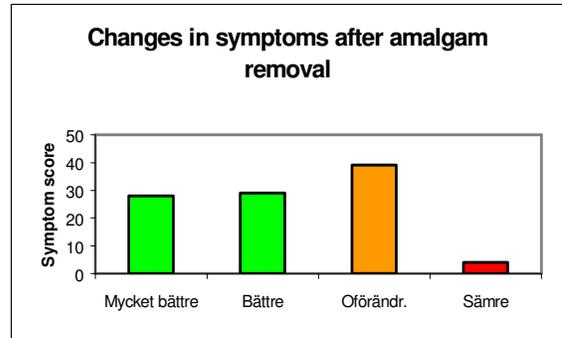


Larose, 1992

80 patients

Evaluation 3 months after finished amalgam removal.

Common symptom: Tiredness (much better or better in 32 of 40), problems concentration (21/27), headache (12/20), metal taste (20/22), high blood pressure (1/33), tachycardia (7/30), MS (5/10), muscle and joint pains (9/17), depression (14/18), loss of memory (9/18), nervousness/anxiety (12/17).



P. Larose. The effect of amalgam removal on 37 health symptoms in humans. Updated 1992 from study reported in Dental Health & Facts 2(1) 1989. Foundation for Toxic-free Dentistry/Bio-Probe, Orlando

Engel, 1998

75 patients

Women 52

Men 23

Mean age 48,4 y. (19-73)

No. am-fillings, mean 10,8 (3-19)

Follow-up, mean 16 mo. (0-116)

Evaluation: Patients own estimate of health before and after amalgam removal.

Clean-up and cofferdam used during drilling.

Common symptoms:

Pains in joints, back, neck, shoulder, arms

Headache, migraine

Vertigo

Vision disturbances

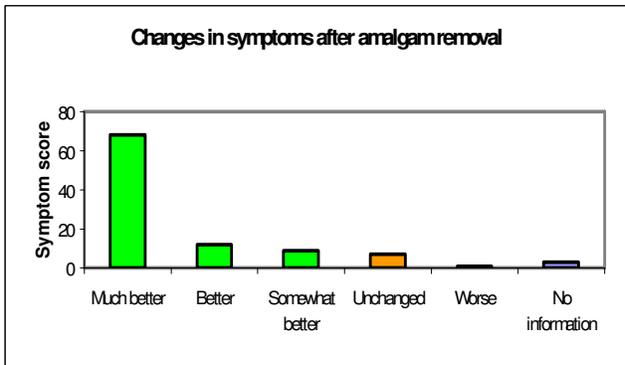
Paresthesias

Allergies

Gastrointestinal problems

Tiredness

Psychic problems



Engel, P. Beobachtung über die Gesundheit vor und nach Amalgamentfernung. Schw.

Monatschr. Zahnmed. 108, 1998, 811-813.

Hovmand, 1987

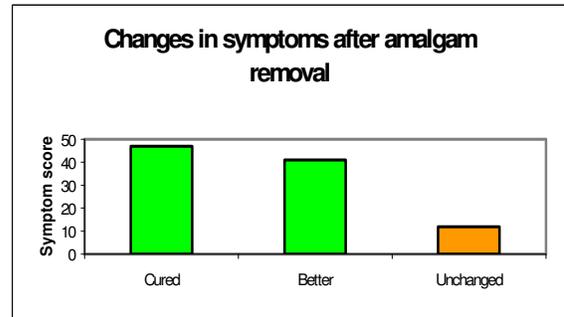
59 patients

59 patients. All fillings removed in 43, partly in 16.

Evaluation according to % improvement for patients with a certain symptom.

Common symptoms: Headache/migraine, metal taste (100 improvement.), tiredness, back/joints, gastrointestinal, depression, and eczema.

Hovmand, O. Oral galvanisme - erfaringer fra praksis. Tandlaegebladet 91, 1987, 473-476.



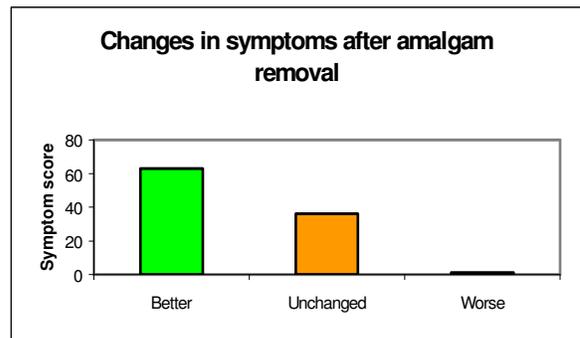
22 patients

Zamm, 1990

22 patients reported a total of 584 symptoms
Evaluation according to changes in symptom severity for patients with certain symptoms.
Follow-up, mean 7,3 mo. (1,5-15)

Common symptoms: headache, vertigo, irritability, anxiety, difficulty concentrating, difficult to think, mental confusion, "groggy", reading difficulties, bad memory, depression, dermatitis, sinusitis, achycardia, myalgia, exhaustion, weakness.

Zamm, AV. Removal of dental mercury: often an effective treatment for the very sensitive patient. J Orthomol. Med. 5, 1990, 138-142.



Lindh et al, 2002

463 patients

Changes in health after amalgam removal according to fig. 1 in the report (Much better 4-6 on scale, better 1-3, worse -1 till -3, much worse -4 till -6.)

Dropout investigation did not demonstrate any difference between those answering and not answering questionnaire.

Common symptoms: Tiredness, depression, muscle pains, easily exhausted, difficulty concentrating, muscle problems in whole body, gastrointestinal problems, mouth symptoms, sleeping disturbances, unpleasant feelings in hands and feet, memory disturbance, vertigo/unsteady, headache, difficulty thinking, joint problems.

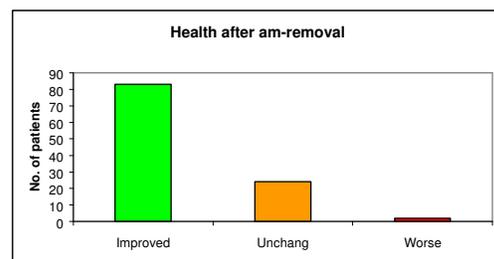
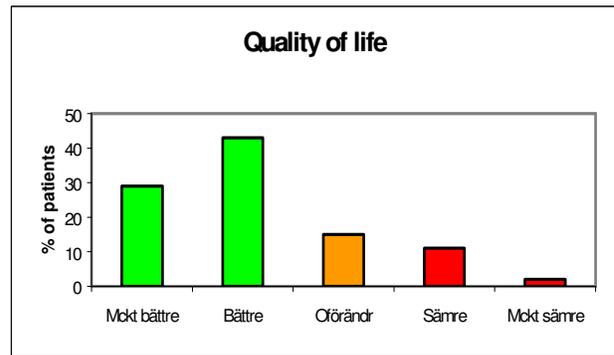
Lindh, U, Hudecek R, Danersund A, Eriksson S, Lindvall A. Removal of dental amalgam and other metal alloys supported by antioxidant therapy alleviates symptoms and improves quality of life in patients with amalgam-associated ill health. *Neuroendocrinol Lett* 5/6, 2002, 459-482

Stejskal et al, 1999

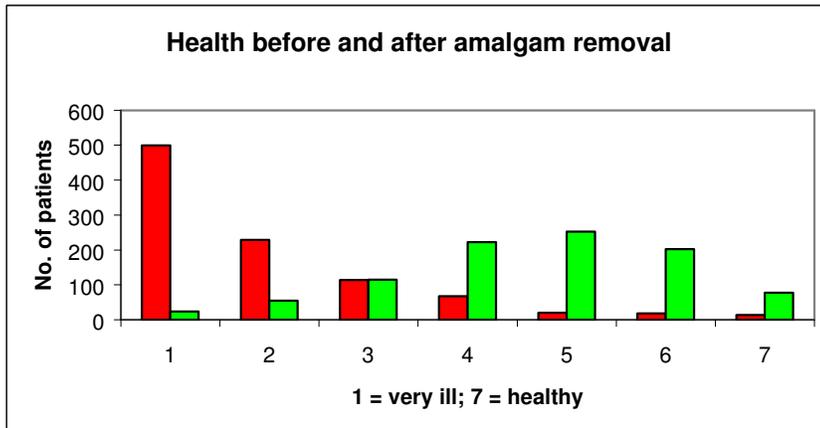
98 patients

The majority of patients (77 %) fulfilled the criteria for CFS, the remaining ones lacked one of the major criteria or several of the minor ones.

Metal-specific lymphocytes: biomarkers of sensitivity in man Stejskal VDM, Danersund A, Lindvall A, Hudecek R, Nordman V, Yaqob A, Mayer W, Bieger W, Lindh U. *Neuroendocrinol Lett.* 20, 1999, 289-98.

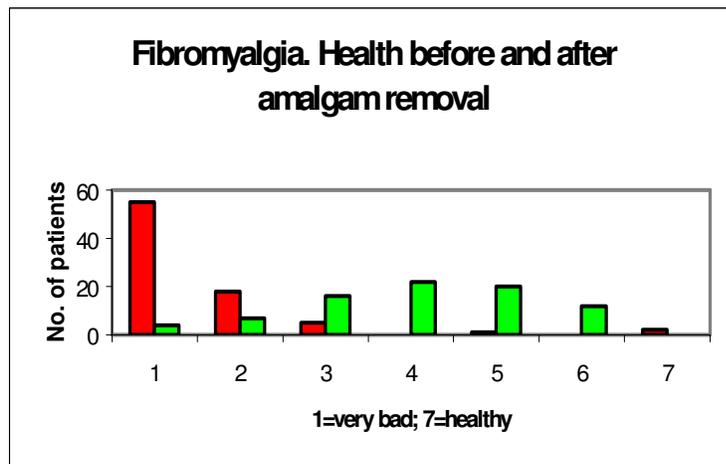
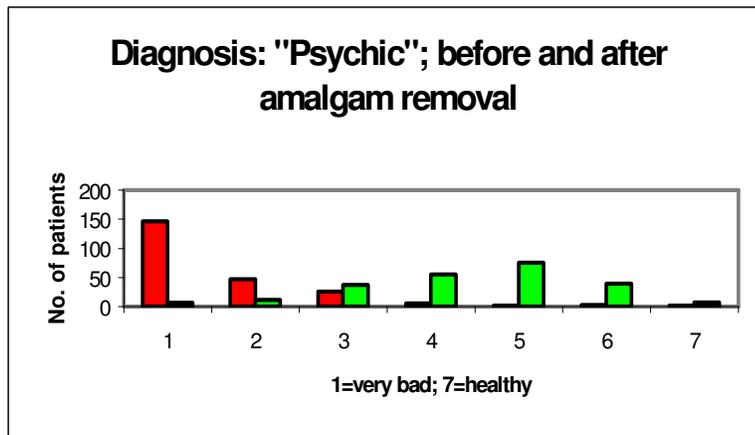


**Dental Materials and Health,
Swedish Dept. of Health, 2003, SOU
2003:53, Appendix 10.**

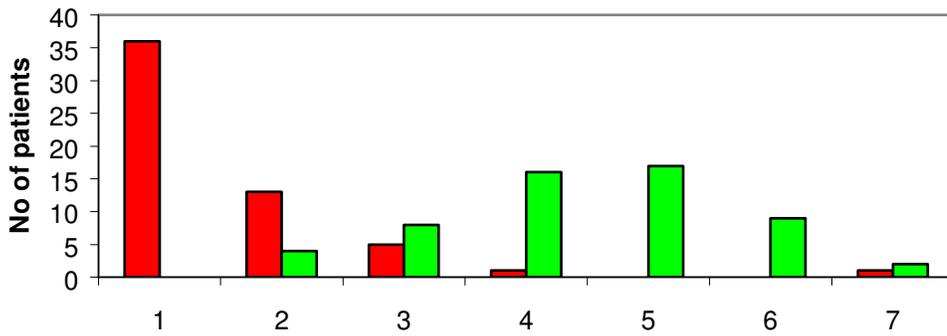


Before amalgam removal ■

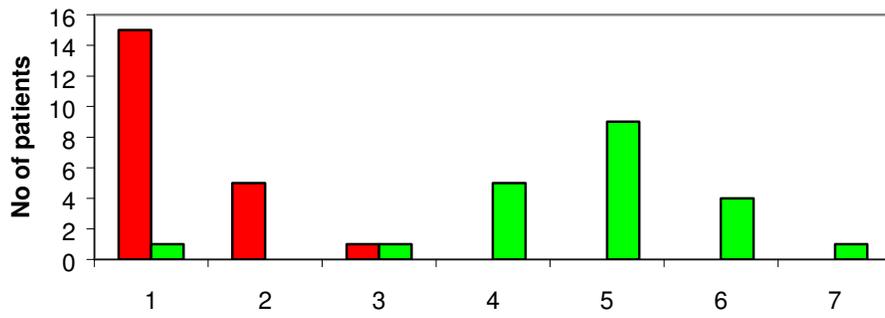
After amalgam removal ■



Chronic fatigue syndrome; effects of amalgam removal



Neurasthenia; Health before and after amalgam removal



"Burn-out"; Health before and after amalgam removal

