

# RESULTS OF DENTAL AMALGAM REMOVAL AND MERCURY DETOXIFICATION USING DMPS AND NEURAL THERAPY

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*Sixty consecutive patients who had undergone replacement of dental amalgam fillings and a protocol of nutritional support and heavy metal detoxification using dimercapto-propanyl-sulfate and neural therapy were surveyed. A questionnaire was mailed to the patients and 42 responded, resulting in a response rate of 70%. The reasons for undergoing treatment were many, ranging from a patient's desire to avoid potential health problems in the future to treatment of serious current disease. Although medical diagnoses were made when possible before treatment, this survey studied only the patients' estimations of their most distressing symptoms and their evaluations of response to treatment. The most common complaints were problems with memory and/or concentration; muscle and/or joint pain; anxiety and insomnia; stomach, bowel, and bladder complaints; depression; food or chemical sensitivities; numbness or tingling; and eye symptoms, in descending order of frequency. The most distressing symptoms were headache and backache, fatigue, and memory and concentration problems. Headache and backache responded best to treatment, but all symptoms showed considerable improvement on average. Of the respondents, 78% reported that they were either satisfied or very satisfied with the results of treatment, and 9.5% reported that they were disappointed. (Altern Ther Health Med. 2000; 6(4):49-55).*

**T**he results of amalgam removal and mercury detoxification in a group of patients were studied by surveying the patients' retrospective evaluation of symptoms. Patients were selected from the author's private practice and had been treated during the years 1994 to 1997. Only 2 criteria were required to be included in the study: (1) dental amalgam fillings had been replaced with nonmetallic fillings and (2) the patient had undergone an adequate program of nutritional support and detoxification.

Until 1994, the practice had been limited mostly to patients

with chronic musculoskeletal pain. At that time, the author became aware that chronic mercury poisoning was an underlying factor in a certain proportion of difficult-to-treat musculoskeletal pain patients. Success in treating some of these patients led to requests for treatment from others with nonmusculoskeletal symptoms. Most of these requests came from patients who had on their own learned of a potential causative relationship of mercury amalgam fillings and a variety of poorly understood diseases. These included chronic fatigue syndrome, fibromyalgia, depression, multiple chemical and/or food sensitivities, multiple sclerosis, and other ill-defined neurological diseases.

The decision to recommend amalgam filling removal and medical detoxification was not entirely patient driven. The diagnostics of mercury toxicity from amalgam fillings is primarily clinical and patients who did not "fit" were not treated this way. However, if there was doubt about the diagnosis of mercury toxicity, weight was given to those patients who had exhausted all other means of treatment and who had particularly distressing or disabling conditions (eg, multiple sclerosis). Therefore, a wide range in pretreatment confidence in outcome existed.

## DIAGNOSIS OF CHRONIC MERCURY TOXICITY FROM DENTAL AMALGAM FILLINGS

As mentioned above, chronic mercury poisoning is a clinical diagnosis. When the exposure is to elemental mercury, as from dental amalgam, no readily available laboratory test can detect its presence in body tissues or fluids (note 1). This is in contrast to exposure to mercury salts, which can be readily detected in blood, urine, and hair.

The characteristic symptoms of mercury poisoning have been known for almost 200 years and can be found in any textbook of internal medicine or toxicology. Many of these texts relate to mercury's effect on the central nervous system and include memory loss, difficulty concentrating, depression, anxiety, tremor, and numbness and tingling of extremities. What is often less appreciated is that the autonomic nervous system is also affected. Because the autonomic nervous system "regulates" every organ of the body, a wide range of symptoms, from migraine headache to cardiac palpitations to bladder or bowel disturbance, is possible.

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Some patients present with chronic widespread musculoskeletal "achiness" in patterns fitting the criteria of fibromyalgia. The oral cavity, because of its proximity to the amalgam,<sup>1</sup> is vulnerable to periodontal infections, jaw bone abscesses, and "neuralgia-inducing cavitation osteonecrosis lesions,"<sup>2</sup> as well as mucosal conditions including leukoplakia. Maxillary sinus congestion and infections are common and a metallic taste may be present in the mouth.

In recent years, it has become increasingly apparent that mercury toxicity may compromise immune function.<sup>3</sup> This may present as poor resistance to infection or as "sensitivity" (eg, headache, fatigue, malaise, and "brain fog") when exposed to perfumes, certain foods, alcoholic beverages, petroleum products, and other chemicals. Yeast overgrowth of bowel flora, mucosal surfaces, or skin occurs and responds poorly or only temporarily to changes in diet and specific treatment of yeast.<sup>4</sup>

Index of suspicion should increase in patients who have been nutritionally weakened by poor diet or long-term use of medications that disturb gastrointestinal function. Nonsteroidal anti-inflammatory drugs, antibiotics, and antiulcer drugs are common culprits. Vegetarians and others on high-carbohydrate, low-protein diets are at risk, especially if they are physically active or under other stress.

Onset or exacerbation of symptoms soon after removal or replacement of amalgam fillings is a clue in diagnosis. A history of filling placements early in childhood may be found in individuals with excessive sensitivity to mercury, and concurrent exposure to other toxins (eg, nickel, lead, and solvents), seems to potentiate the body's susceptibility to mercury.<sup>5</sup>

Physical examination should include a psychiatric assessment of affect, memory, and cognition.<sup>6</sup> A neurological examination should search for tremor, especially of the tongue. Facial skin color is often ashen-gray or, less commonly, plethoric, demonstrating the extremes of autonomic dysregulation of skin circulation. Posture and skin texture may expose the premature aging,<sup>7</sup> which comes with chronic mercury toxicity.

Mercury "tattoos" in the oral mucosa and underlying tissues are sometimes found near amalgam-filled teeth. Receding unhealthy gums often accompany teeth with leaking amalgam fillings. Mercury toxicity should always be considered with unexplained, "essential," hypertension, hypotension, and/or cardiac palpitations. Cold hands and feet may be present with or without the mild electrolyte disturbances (eg, low-normal serum sodium and/or calcium), which often accompany mercury toxicity. A low basal temperature, with normal serum thyroid parameters, is almost always present. In addition, albuminuria or even nephrotic syndrome should alert the physician to the possibility of mercury poisoning.<sup>8</sup>

A controversial but invaluable tool in diagnosing chronic mercury poisoning is autonomic response testing. A number of techniques may be used, including Chinese pulse examination, electroacupuncture according to Voll, craniosacral rhythm examination, pupil diameter response, or muscle strength testing (applied kinesiology). The common denominator of these methods is that mercury, or a substance that will treat mercury poi-

soning such as dimercapto-propanyl-sulfate (DMPS), when placed on or near the body, will cause an autonomic response. In this study, muscle strength testing using the shoulder flexors as indicators was the method usually used.

## TREATMENT PROTOCOL

The treatment protocol consisted of the modified Klinghardt Protocol.<sup>9</sup> At least 6 weeks before dental amalgam removal, patients were instructed to take chlorella, starting with 1 capsule per day and then increasing the dosage each day (if tolerated) to 7 to 9 capsules per day in divided doses. Gastrointestinal symptoms or an exacerbation of preexisting symptoms were common, and if these occurred, the patient reduced the dosage to the maximum tolerated dose (MTD). Patients were encouraged to periodically test their MTD and adjust accordingly as it always increased with time.

In the later stages of this study, patients were instructed to increase their chlorella consumption on the 9th and 10th days to 10 times their MTD, or to a maximum of 60 capsules a day, followed by 2 days of no chlorella and then a return to the previous MTD level. Patients invariably tolerated high doses, as well as the MTD. This paradoxical phenomenon appears to be due to chlorella's chelating effect in the bowel, compensating adequately for its stimulatory effect on intracellular mercury elimination.<sup>10</sup> In higher doses, it seems to act as an ion exchange resin in the gut, chelating mercury from the extra-hepatic circulation.<sup>11</sup>

Oral vitamin C was recommended in divided doses to bowel tolerance. This ranged from 3000 mg to 24000 mg per day. Garlic consumption and an increased protein diet were encouraged.

Patients with obvious systemic illness (eg, chronic fatigue syndrome, fibromyalgia, or medically diagnosable disease) underwent a nutritional status evaluation using physical examination, complete blood cell count, and chem 26 analysis (or equivalent). Typically, oral supplements including electrolyte solutions, mineral supplements, betaine hydrochloride, ammonium chloride, gamma linoleic acid, and eicosapentanoic acid were given as required, as well as dietary advice to balance macronutrient ratios (Health Equation Inc, written communication, 1994-1997). This group of patients was maintained on this nutritional program for several months before dental amalgam removal.

Patients were instructed in how to choose a dentist to perform the amalgam filling replacements. The following factors were considered essential:

- The dentist should understand the hazards of mercury vapor released during the dental work and be sympathetic to the risk this might entail to the patient's health.
- A rubber dam should be used during amalgam removal.
- The work area should be flushed frequently with water and supplemental oxygen supplied via nasal cannula.
- The dentist should be experienced and quick enough in placement of composite fillings that (if possible) all the work be done in 1 sitting (note 2).

Ideally, the dentist should have demonstrated an understanding of the hazard of mercury amalgam by establishing a "mercury-free" practice. Immediately after the final fillings were removed (within hours), the patient went to the physician's office where an intravenous infusion of 500 mL of sterile water, 25 g of vitamin C (note 3), 1 g of calcium gluconate, and 250 mg of DMPS were administered over approximately 1 hour.

The patient was then checked for "interference fields" (note 4) by autonomic response testing, using the shoulder flexor muscles as indicators (applied kinesiology) and treated with neural therapy as needed. On discharge, the patient was given a 24-hour urine collection kit with a specimen bottle to be sent to a laboratory for analysis of mercury and other toxic metals and the common physiological elements.

Twenty-four hours after the DMPS treatment, the patient began an oral mineral replacement and antioxidant regimen. Chlorella and vitamin C were continued as before amalgam-filling replacement, and in patients with central nervous system symptoms, cilantro was taken either fresh or as herbal drops.<sup>12</sup>

Patients were seen 4 weeks later, unless they experienced unusual fatigue, headache, or depression in the interim. It was not unusual for some worsening of symptoms to develop in the day or two following treatment, but if this worsening persisted, an interference field in an organ (most commonly liver or kidney) was usually found and was treated. Patients were instructed to call for an appointment should this happen.

Every 4 weeks, a 250-mg DMPS injection was given intravenously with 5 mL procaine 0.5% over 5 minutes and any interference fields were treated with neural therapy. Every third session, the 24-hour urinary excretions of mercury and other metals were measured.

	Characteristics of subjects		
	Men	Women	Did not report
Number	11	25	6
Age range (y)	36-59	30-74	
Average age (y)	43	49	

Active treatment ended when symptoms were relieved and/or the 24-hour urinary excretion of mercury fell below 2 µg. Patients were advised, however, to continue taking chlorella, vitamin C, and garlic for many months even if symptoms had disappeared.

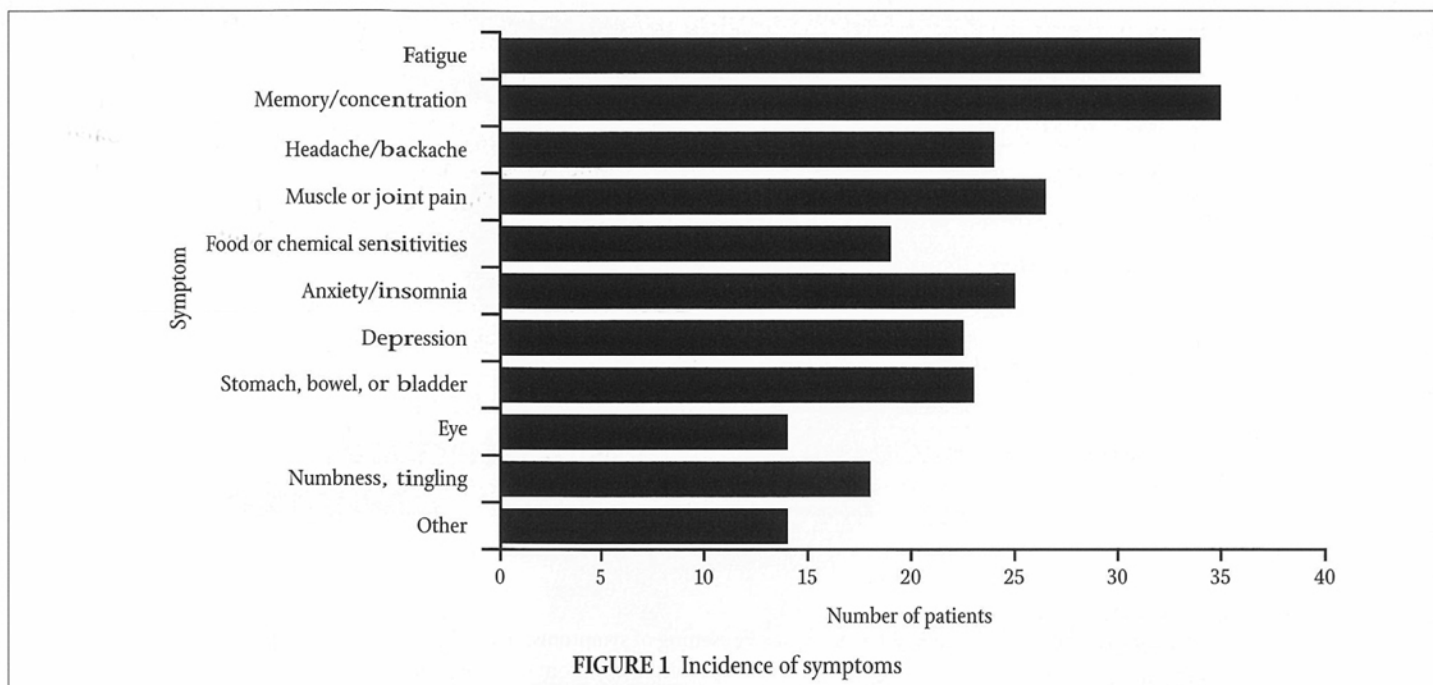
## QUESTIONNAIRE

Patients were mailed a questionnaire with a stamped return envelope. Characteristics of respondents are shown in the Table. The patients were requested not to identify themselves other than by age and sex and to answer the questions as honestly as possible. Respondents were specifically encouraged not to attempt to please their physician by overstating any improvement or concealing disappointment in results.

In the questionnaire, patients were asked to indicate their symptoms in descending order of severity from a list (Figures 1 and 2), any change in symptoms (Figure 3), and their overall level of satisfaction or dissatisfaction (Figure 4).

## RESULTS

In Figure 1, the incidence of specific complaints among respondents before treatment began is reported. The incidence



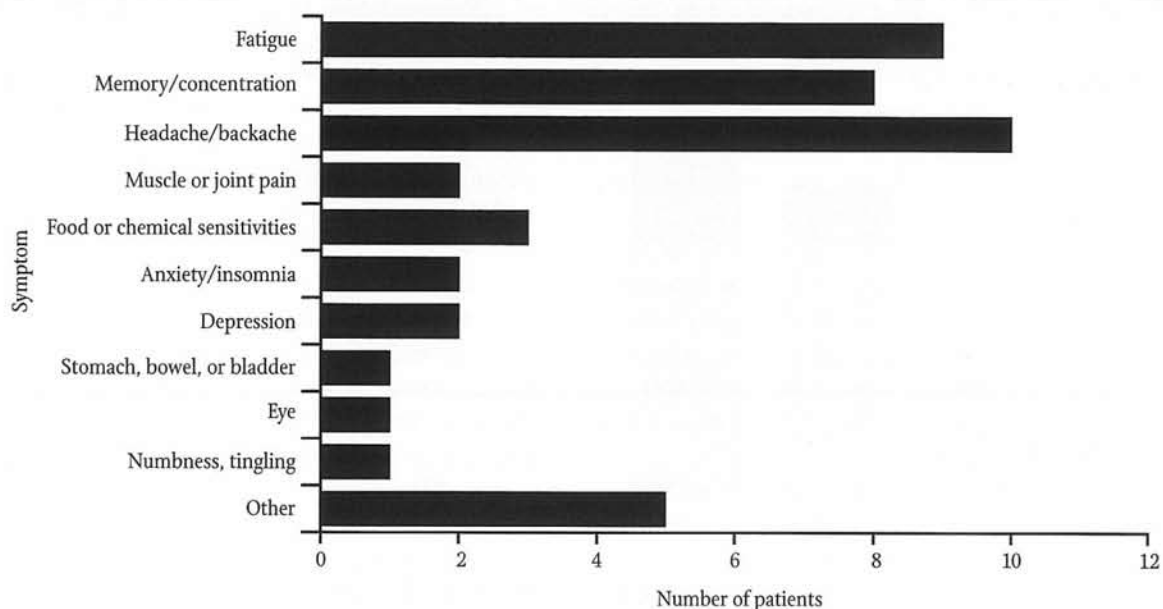


FIGURE 2 Incidence of chief complaint

of the complaint that distressed respondents the most is shown in Figure 2. Although most respondents suffered from fatigue and disturbance of memory and concentration, the most distressing complaints in this group were headache and backache.

Respondents reported the improvement in each symptom on a scale of 0 (no change) to 4 (complete relief). Figure 3 shows that all the complaints reported were amenable to treatment at least to some degree. No symptom stands out as being

uniformly intractable or responsive to the treatment provided. Because average values are reported in Figure 3, individual cases with complete relief and other cases with no relief are obscured in the data.

Figure 4 reports the patients' overall level of satisfaction with the process. The "satisfaction" level encompasses intangible factors that go beyond mere symptom relief. Parameters measured in Figure 4 therefore include, but are not limited to, the symptoms reported in Figure 3.

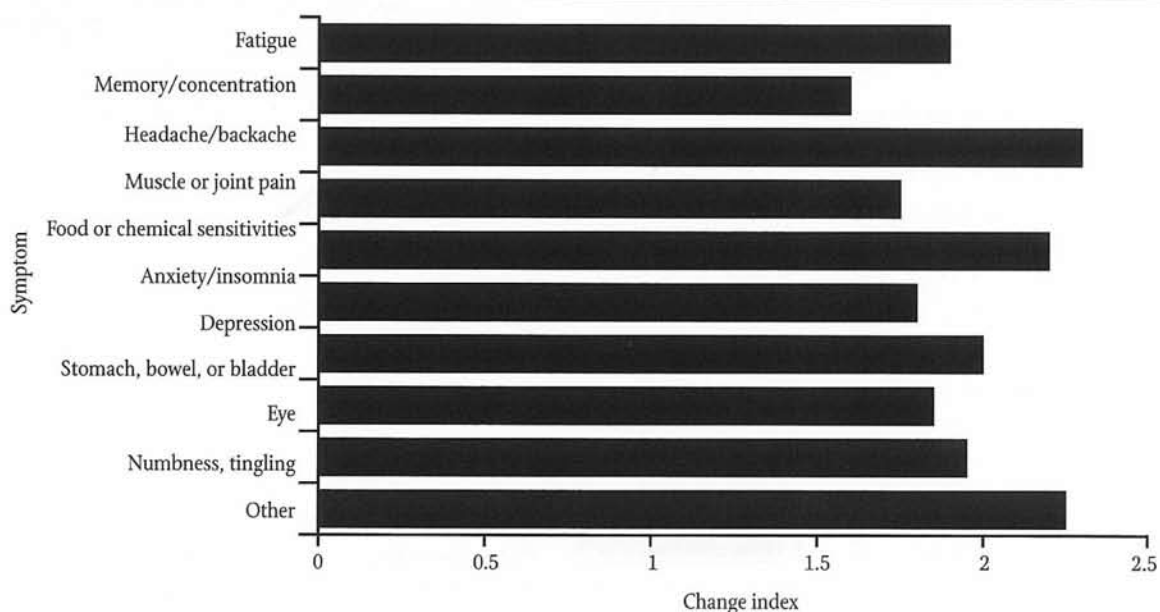
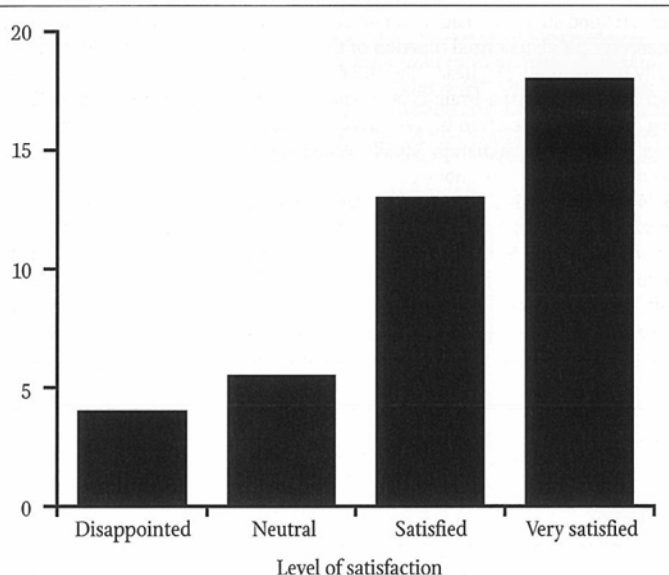


FIGURE 3 Scale used to indicate changes in symptoms: -1 indicates worsening of symptoms; 0, no change; 1, some improvement; 2, moderate improvement; 3, almost free of symptoms; 4, symptom entirely gone.





**FIGURE 4** Overall satisfaction. Scale used to indicate level of satisfaction: -1 indicates disappointed; 0, neither disappointed nor satisfied; 1, satisfied; 2, very satisfied.

## DISCUSSION

Mercury poisoning from dental amalgam fillings continues to be a controversial subject, with most mainstream dental associations still denying its existence. Some authorities and holistic dental associations take it seriously, however, and several European countries forbid or limit the use of amalgam in dentistry. In California, patients are required to be informed by their dentists about the health risks of amalgam fillings,<sup>13</sup> and dentists are required to post a notice that they use mercury, "as mercury has been determined by the state to cause reproductive harm."<sup>14</sup> In Canada, the Richardson Report to the federal government Ministry of Health has recommended that amalgam not be used in pregnant women and children, and in adults the number of fillings is limited to 3 or 4.<sup>15</sup> In addition, tens of thousands, if not hundreds of thousands, of individuals (including the author) have had dental amalgam fillings removed with or without detoxification and claimed significant, lasting improvement in health.<sup>16</sup>

It is indeed difficult to prove that amalgam fillings cause illness. Many people seem to tolerate a mouthful of metal fillings with no apparent adverse effects. Others seem to be made very ill by just a few. Clearly, other factors play a role in pathogenesis.

Mechanical factors such as toothbrushing, chewing, and bruxism are known to increase the release of mercury vapor from fillings.<sup>17</sup> Electrogalvanism (electrical currents between dissimilar metals through saliva) does the same.<sup>18</sup>

When mercury vapor is inhaled, 80% is absorbed through the lungs, and because of the lipophilic nature of mercury vapor, it easily crosses cell membranes and the blood-brain barrier.<sup>19,20</sup> In the cells, mercury vapor eventually binds to glutathione (GSH) and cysteine, but proteins, such as the metallothioneins, appear to compete effectively for mercury and other heavy metals as well.<sup>21</sup>

Mercury's toxic effects are "vast and nondescript," but may be categorized in 3 main areas of cellular metabolism<sup>22</sup>: (1) alteration of membrane structure and mitochondrial function through enhancement of lipid peroxidase and hydroxyl radical production; (2) inhibition of antioxidant processes through enhancement of GSH excretion, inhibition of GSH metabolism, and other antioxidant processes, including those using superoxide dismutase; and (3) disruption of protein structure through binding to sulfhydryl groups.

Individual vulnerability to the toxic effects of mercury may be explained at least in part by the interaction of other toxins and nutrients on the above processes. For example, dietary protein deficiency may result in cellular GSH deficiency and limit the cell's ability to excrete mercury. Selenium is known to have a protective effect and its deficiency may limit GSH peroxidase's antioxidative activity.<sup>23</sup> Because transition metals such as copper and zinc compete with heavy metals for binding sights on certain proteins, their deficiency might result in fixing of more mercury in the body tissues. Competition for these sights may explain the clinical observation that susceptibility to mercury poisoning appears to be inversely related to mineral nutritional status.

Also important is the interaction of mercury with other toxins. Lead and other heavy metals may potentiate the toxic effects of mercury<sup>6</sup>; metabolites of intraoral anaerobic infection such as mercaptan and thioether may potentiate these toxic effects as well (B. E. Haley, unpublished data, 1999). The presence of root-canal-filled teeth and periodontal infection should raise the index of suspicion of mercury poisoning.

Individual "sensitivity" to mercury may explain at least part of this variability in response to a given dose. Although this sensitivity may not be entirely immune-system mediated, ionic mercury is known to be antigenic in rats and capable of inducing autoimmunity.<sup>24</sup> This author has had 1 patient with advanced glomerulonephritis and nephrotic syndrome who has had complete and long-lasting remission with amalgam removal and detoxification.

Children are known to tolerate mercury exposure less than adults do. Adults who seem to be disproportionately affected often give a history of exposure to amalgam fillings early in life. One patient remembered feeling "sad" from about age 6, and had chronic depression until her fillings were removed in her late thirties.

Hormonal factors probably play a role. It is not unusual for the symptoms of mercury poisoning to develop during a time of stress, presumably when cortisol levels are high. The stresses may include infections, other illnesses, accidents, and emotional or situational stress. It is not rare for the viral illnesses that seem to precipitate chronic fatigue to divert attention from underlying mercury toxicity.<sup>4</sup>

Because of these many potential contributing factors, treatment must be individualized. Nutritional support, particularly of dietary protein and minerals, is fundamental, however, and in relatively healthy people may be all that is required. In symptomatic patients, chlorella is perhaps the most important therapeutic tool; it has a vast supporting scientific literature<sup>25</sup> and its clinical effect is quickly apparent. In fact, the temporary worsening of

symptoms that commonly occurs on initiating treatment is a useful diagnostic sign of mercury poisoning.

Dimercapto-propanyl-sulfate is well established as a first line of treatment for acute mercury poisoning. Numerous studies show that urinary mercury excretion increases significantly in subjects with amalgam fillings and in dental workers handling amalgam.<sup>26</sup>

Neural therapy in treatment of mercury toxicity has less scientific support. This technique was introduced to North America from Germany by Dietrich Klinghardt, MD, PhD, and is taught in courses offered by the American Academy of Neural Therapy. It is of particular value as a part of the detoxification process in the sick patient where clinical improvement is often noted within minutes or hours. The theory behind its use is that mercury will sometimes "overload" a particular organ or region of the body, especially during the mobilization accompanying detoxification. The autonomic nervous system's control of circulation to the areas goes into an "alarm" state, restricting blood flow and impairing function. In the case of the liver, fatigue, depression, and often headache result.

Neural therapy will "switch" the autonomic nervous system to a vasodilatory phase, seemingly washing out mercury and restoring the organ's normal autonomic tone. Because some patients' symptoms worsen after amalgam removal, mercury detoxification should not be performed in sick patients without this invaluable therapeutic tool.

## SUMMARY

The whole subject of diagnosis and treatment of chronic mercury poisoning cries out for more clinical research. However, the condition is so pervasive, and often so serious, that clinicians should not hold back until the research is done. The approach as outlined in this article is safe, seemingly efficacious, and one of the most satisfying therapeutic endeavors that a clinician can experience in medicine.

## Notes

1. A DMPS provocation test is recommended by some to assess the body burden of mercury. An intravenous injection of DMPS (3 mg/kg) is followed by a 24-hour collection of urine that is analyzed for mercury excretion. However, this author no longer performs this test in patients with amalgam fillings for safety reasons. On one occasion, a patient with multiple large fillings experienced anuria and mental confusion for 18 hours following an injection of DMPS. This was relieved immediately by neural therapy injections of dilute procaine into the kidney skin reference area.
2. For safety reasons, rapid complete replacement of amalgam should be undertaken only within the context of this protocol. Acute mercury poisoning can occur if aggressive detoxification procedures including neural therapy are not available. Gradual filling replacement over weeks or months combined with a detoxification program using diet, nutritional supplements, and homeopathics is an alternative approach, but takes longer and sometimes makes patients tired and depressed during the process.
3. Intravenous vitamin C frequently has a dramatic, immediate effect on a patient's sense of well-being, which usually lasts 2 or 3 days. This effect coincides with a several-fold increase of mercury excretion into the gut and seems to be due to the ability of vitamin C to reduce GSH (D. Quig, PhD, oral communication, May 1999).
4. Interference fields in this context usually refer to an organ or body region that has been overstressed by the mobilization of mercury. Typical stressed areas are the liver, kidneys, thyroid, the tissues innervated by the superior cervical and/or sphenopalatine ganglia, the facial sinuses, and the brain. When in

this stressed state, circulation is reduced, which not only impairs extraction of mercury, but also normal function of the organ. A liver interference field typically results in fatigue, headache, and depression; a kidney interference field, in fatigue and anuria; a brain interference field, in mental confusion or "brain fog." This stress reaction is presumably due to autonomic nervous system dysregulation, as neural therapy usually results in subjective and objective improvement within minutes or hours.

5. Neural therapy is a German diagnostic and therapeutic system that recognizes localized disturbances of the autonomic nervous system (interference fields) and their relationship to dysfunction and disease. Interference fields are commonly found in scars, teeth, jaw bone cavitations, somatic dysfunctions, autonomic ganglia, peripheral nerves, and organs. Injections of dilute procaine into the affected tissues intravenously "regulate" or return the autonomic dysfunction to normal. The classic textbook on the subject is the *Manual of Neural Therapy According to Huneke*.<sup>26</sup>

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