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SUPPLEMENTARY (OPTIONAL) CONTENT FOR UNIT 4

☐ Watch the “Dr. Chris Shade on New Methods of Mercury Testing and Detoxification” You Tube video at https://www.youtube.com/watch?v=FTIbnGMIHmE


☐ Read the “Sugar Causes Tooth Decay” patient handout. Click here to go to page 10.

☐ Watch the “Glutathione as the Central Mediator in the Combined Dis-ease of Toxicity, Chronic Infection, and Inflammation” You Tube video of Dr. Chris Shade at https://www.youtube.com/watch?v=oN-1iFMzKbE

☐ Read the “Antitoxic Program” IAOMT Scientific Review. Click here to go to pages 11-14.

☐ Read the “Biophotonic Scanner” IAOMT Scientific Review

☐ Read the “Blood Testing to Determine Mercury Toxicity from Amalgam Fillings” IAOMT Scientific Review. Click here to go to pages 15-16.

☐ Read the “Chlorella” IAOMT Scientific Review. Click here to go to pages 17-18.
Read the “Clay Use as a strong Broad-Spectrum Antibacterial (De-Bugging) Agent and Detoxification Vehicle” IAOMT Scientific Review. Click here to go to pages 19-23.

Read the “Coenzyme Q10” IAOMT Scientific Review. Click here to go to pages 24-25.

Read the “DMSA Chelation Therapy in Dentistry” IAOMT Scientific Review. Click here to go to pages 26-27.

Read the “Hall-V-Tox” IAOMT Scientific Review. Click here to go to pages 28-29.


Read the “The IV-C Mercury Tox Program: A Guide for the Patient” IAOMT Scientific Review. Click here to go to pages 32-33.

Read the “Low Dose Cytokines & Mercury Amalgams Fillings” IAOMT Scientific Review. Click here to go to pages 34-39.

Read the “N-Acetyl-L-Cysteine (NAC) Role in Mercury Exposure Protection and/or Detoxification” IAOMT Scientific Review. Click here to go to pages 39-40.

Read the “Oral Detox Pro Oral Rinse” IAOMT Scientific Review. Click here to go to pages 41-48.

Read the “Oral Megadose Ascorbate (Vitamin C)” IAOMT Scientific Review. Click here to go to pages 49-51.
Review Article

The Alkaline Diet: Is There Evidence That an Alkaline pH Diet Benefits Health?

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This review looks at the role of an alkaline diet in health. Pubmed was searched looking for articles on pH, potential renal acid loads, bone health, muscle, growth hormone, back pain, vitamin D and chemotherapy. Many books written in the lay literature on the alkaline diet were also reviewed and evaluated in light of the published medical literature. There may be some value in considering an alkaline diet in reducing morbidity and mortality from chronic diseases and further studies are warranted in this area of medicine.

1. Background

Life on earth depends on appropriate pH levels in and around living organisms and cells. Human life requires a tightly controlled pH level in the serum of about 7.4 (a slightly alkaline range of 7.35 to 7.45) to survive [1].

As a comparison, in the past 100 years with increasing industrialization, the pH of the ocean has dropped from 8.2 to 8.1 because of increasing CO₂ deposition. This has a negative impact on life in the ocean [1, 2] and may lead to the collapse of the coral reefs [3]. Even the pH of the soil in which plants are grown can have considerable influence on the mineral content of the food we eat (as minerals are used as buffers to maintain pH). The ideal pH of soil for the best overall availability of essential nutrients is between 6 and 7. Acidic soils below pH of 6 may have reduced calcium and magnesium, and soil above pH 7 may result in chemically unavailable iron, manganese, copper and zinc. Adding dolomite and manure are ways of raising pH in an acid soil environment when the pH is below 6 [4].

When it comes to the pH and net acid load in the human diet, there has been considerable change from the hunter gather civilization to the present [5]. With the agricultural revolution (last 10,000 years) and even more recently with industrialization (last 200 years), there has been an
decline in potassium (K) compared to sodium (Na) and an increase in chloride compared to bicarbonate found in the diet [6]. The ratio of potassium to sodium has reversed, K/Na previously was 10 to 1 whereas the modern diet has a ratio of 1 to 3 [7]. It is generally accepted that agricultural humans today have a diet poor in magnesium and potassium as well as fiber and rich in saturated fat, simple sugars, sodium, and chloride as compared to the pre-agricultural period [6]. This results in a diet that may induce metabolic acidosis which is mismatched to the genetically determined nutritional requirements [8]. With aging, there is a gradual loss of renal acid-base regulatory function and a resultant increase in diet-induced metabolic acidosis while on the modern diet [9]. A low-carbohydrate high-protein diet with its increased acid load results in very little change in blood chemistry, and pH, but results in many changes in urinary chemistry. Urinary magnesium levels, urinary citrate and pH are decreased, urinary calcium, undissociated uric acid, and phosphate are in-creased. All of these result in an increased risk for kidney stones [10].

Much has been written in the lay literature as well as many online sites expounding on the benefits of the alkaline diet. This paper is an attempt to balance the evidence that is found in the scientific literature.
It has been estimated that the quantity of calcium lost in the systemic circulation to bring about pH homeostasis [7]. A large reservoir of base in our body.

**2. The Role of pH in Various Cells, Organs, and Membranes**

The pH in our body may vary considerably from one area to another with the highest acidity in the stomach (pH of 1.35 to 3.5) to aid in digestion and protect against opportunistic microbial organisms. But even in the stomach, the layer just outside the epithelium is quite basic to prevent mucosal injury. It has been suggested that decreased gastric lining secretion of bicarbonates and a decrease in the alkaline/acid secretion in duodenal ulcer patients may play a significant role in duodenal ulcers [11]. The skin is quite acidic (pH 4–6.5) to provide an acid mantle as a protective barrier to the environment against microbial overgrowth. There is a gradient from the outer horny layer (pH 4) to the basal layer (pH 6.9) [12]. This is also seen in the vagina where a pH of less than 4.7 protects against microbial overgrowth [13].

The urine may have a variable pH from acid to alkaline depending on the need for balancing the internal environment. Acid excretion in the urine can be estimated by a formula described by Remer (sulfate + chloride + 1.8x phosphate + organic acids) minus (sodium + potassium + 2x calcium + 2x magnesium) mEq [14]. Foods can be categorized by the potential renal acid loads (PRALs) see Table 2. Fruits, vegetables, fruit juices, potatoes, and alkali-rich and low phosphorus beverages (red and white wine, mineral soda waters) having a negative acid load. Whereas, grain products, meats, dairy products, fish, and alkali poor and low phosphorus beverages (e.g., pale beers, cocoa) have relatively high acid loads [15]. Measurement of pH of the urine (reviewed in a recent study with two morning specimens done over a five-year span) did not predict bone fractures or loss of bone mineral density [16]. However, this may not be reflective of being on an alkaline or acid diet throughout this time. For more details, see Table 1.

**3. Chronic Acidosis and Bone Disease**

Calcium in the form of phosphates and carbonates represents a large reservoir of base in our body. In response to an acid load such as the modern diet these salts are released into the systemic circulation to bring about pH homeostasis [7]. It has been estimated that the quantity of calcium lost in the urine with the modern diet over time could be as high as almost 480 gm over 20 years or almost half the skeletal mass of calcium [21]. However, urinary losses of cal-cium are not a direct measure of osteoporosis. There are many regulatory factors that may compensate for the urinary calcium loss. When the arterial pH is in the normal range, a mild reduction of plasma bicarbonate results in a negative calcium balance which could benefit from supplementing bicarbonate in the form of potassium bicarbonate [22]. It has been found that bicarbonate, which increases the alkali content of a diet, but not potassium may attenuate bone loss in healthy older adults [23]. The bone minerals that are wasted in the urine may not have complete compensation through intestinal absorption, which is thought to result in osteoporosis. However, adequate vitamin D with a 25(OH)D level of >80 nmol/L may allow for appropriate intestinal absorption of calcium and magnesium and phosphate when needed [24]. Sadly, most populations are generally deficient in vitamin D especially in northern climates [25]. In chronic renal failure, correction of metabolic acidosis with bicarbonate significantly improves parathyroid levels and levels of the active form of vitamin D 1,25(OH)2D3 [26]. Recently, a study has shown the importance of phosphate in Remer’s PRAL formula. According to the formula it would be expected that an increase in phosphate should result in an increase in urinary calcium loss and a negative calcium balance in bone [27]. It should be noted that supplementation with phosphate in patients with bed rest reduced urinary calcium excretion but did not prevent bone loss [28]. The most recent systematic review and meta-analysis has shown that calcium balance is maintained and improved with phosphate which is quite contrary to the acid-ash hypothesis [29]. As well a recent study looking at soda intake (which has a significant amount of phosphate) and osteoporosis in postmenopausal American first nations women did not find a correlation [30]. It is quite possible that the high acid content according to Remer’s classification needs to be looked at again in light of compensatory phosphate intake. There is online information promoting an alkaline diet for bone health as well as a number of books. However, a recent systematic review of the literature looking for evidence supporting the alkaline diet for bone health found no protective role of dietary acid load in osteoporosis [31].
Table 2: Potential renal acid loads (PRALs) of selected foods [20].

<table>
<thead>
<tr>
<th>Food or food group</th>
<th>PRAL mEq of: Cl + P0₄ + SO₄ − Na − K − Ca − Mg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dairy</strong></td>
<td></td>
</tr>
<tr>
<td>Parmesan cheese</td>
<td>34.2</td>
</tr>
<tr>
<td>Processed cheese plain</td>
<td>28.7</td>
</tr>
<tr>
<td>Cheddar reduced fat</td>
<td>26.4</td>
</tr>
<tr>
<td>Hard cheese (average)</td>
<td>19.2</td>
</tr>
<tr>
<td>Fresh cheese (quark)</td>
<td>11.3</td>
</tr>
<tr>
<td>Cottage cheese plain</td>
<td>8.7</td>
</tr>
<tr>
<td>Yogurt whole milk</td>
<td>1.5</td>
</tr>
<tr>
<td>Ice Cream</td>
<td>0.8</td>
</tr>
<tr>
<td>Whole milk</td>
<td>0.7</td>
</tr>
<tr>
<td>Buttermilk</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Eggs</strong></td>
<td></td>
</tr>
<tr>
<td>Eggs yolk</td>
<td>23.4</td>
</tr>
<tr>
<td>Eggs white</td>
<td>1.1</td>
</tr>
<tr>
<td>Eggs chicken whole</td>
<td>8.2</td>
</tr>
<tr>
<td><strong>Meats</strong></td>
<td></td>
</tr>
<tr>
<td>Corned beef</td>
<td>13.2</td>
</tr>
<tr>
<td>Luncheon meat canned</td>
<td>10.2</td>
</tr>
<tr>
<td>Turkey</td>
<td>9.9</td>
</tr>
<tr>
<td>Veal</td>
<td>9.0</td>
</tr>
<tr>
<td>Lean beef</td>
<td>7.8</td>
</tr>
<tr>
<td>Frankfurters</td>
<td>6.7</td>
</tr>
<tr>
<td><strong>Sugars</strong></td>
<td></td>
</tr>
<tr>
<td>Sugar white</td>
<td>−0.1</td>
</tr>
<tr>
<td>Honey</td>
<td>−0.3</td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
</tr>
<tr>
<td>Cucumber</td>
<td>−0.8</td>
</tr>
<tr>
<td>Broccoli</td>
<td>−1.2</td>
</tr>
<tr>
<td>Tomato</td>
<td>−3.1</td>
</tr>
<tr>
<td>Eggplant</td>
<td>−3.4</td>
</tr>
<tr>
<td>Celery</td>
<td>−5.2</td>
</tr>
<tr>
<td>Spinach</td>
<td>−14.0</td>
</tr>
<tr>
<td><strong>Fats and Oils</strong></td>
<td></td>
</tr>
<tr>
<td>Butter</td>
<td>0.6</td>
</tr>
<tr>
<td>Margarine</td>
<td>−0.5</td>
</tr>
<tr>
<td>Olive oil</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Fruits and nuts and fruit juices</strong></td>
<td></td>
</tr>
<tr>
<td>Peanuts</td>
<td>8.3</td>
</tr>
<tr>
<td>Walnuts</td>
<td>6.8</td>
</tr>
<tr>
<td>Grape juice unsweetened</td>
<td>−1.0</td>
</tr>
<tr>
<td>Orange juice unsweetened</td>
<td>−2.9</td>
</tr>
<tr>
<td>Apples or apple juice unsweetened</td>
<td>−2.2</td>
</tr>
<tr>
<td>Apricots</td>
<td>−4.8</td>
</tr>
<tr>
<td>Banana</td>
<td>−5.5</td>
</tr>
<tr>
<td>Black currents</td>
<td>−6.5</td>
</tr>
<tr>
<td>Raisins</td>
<td>−21.0</td>
</tr>
<tr>
<td><strong>Grains and grain products</strong></td>
<td></td>
</tr>
<tr>
<td>Brown Rice</td>
<td>12.5</td>
</tr>
<tr>
<td>Rolled Oats</td>
<td>10.7</td>
</tr>
<tr>
<td>Spaghetti whole meal</td>
<td>7.3</td>
</tr>
<tr>
<td>Spaghetti white</td>
<td>6.5</td>
</tr>
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</table>
Table 2: Continued.

<table>
<thead>
<tr>
<th>Food or food group</th>
<th>PRAL mEq of: Cl + P0₄ + SO₄ − Na − K − Ca − Mg</th>
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<tbody>
<tr>
<td>Cornflakes</td>
<td>6.0</td>
</tr>
<tr>
<td>Rice white</td>
<td>4.6</td>
</tr>
<tr>
<td>Bread rye flower</td>
<td>4.1</td>
</tr>
<tr>
<td>Bread whole wheat</td>
<td>1.8</td>
</tr>
<tr>
<td>Legumes</td>
<td></td>
</tr>
<tr>
<td>Lentils green and brown</td>
<td>3.5</td>
</tr>
<tr>
<td>Green beans</td>
<td>−3.1</td>
</tr>
<tr>
<td>Fish</td>
<td></td>
</tr>
<tr>
<td>Trout brown</td>
<td>10.8</td>
</tr>
<tr>
<td>Cod fillets</td>
<td>7.1</td>
</tr>
<tr>
<td>Beverages</td>
<td></td>
</tr>
<tr>
<td>Beer pale</td>
<td>0.9</td>
</tr>
<tr>
<td>Coca-Cola</td>
<td>0.4</td>
</tr>
<tr>
<td>Beer draft</td>
<td>−0.2</td>
</tr>
<tr>
<td>Wine white</td>
<td>−1.2</td>
</tr>
<tr>
<td>Coffee infusion</td>
<td>−1.4</td>
</tr>
<tr>
<td>Wine red</td>
<td>−2.4</td>
</tr>
</tbody>
</table>

Another element of the modern diet is the excess of sodium in the diet. There is evidence that in healthy humans the increased sodium in the diet can predict the degree of hyperchloremic metabolic acidosis when consuming a net acid producing diet [32]. As well, there is evidence that there are adverse effects of sodium chloride in the aging population. A high sodium diet will exacerbate disuse-induced bone and muscle loss during immobilization by increasing bone resorption and protein wasting [33]. Excess dietary sodium has been shown to result in hypertension and osteoporosis in women [34, 35]. As well, dietary potassium which is lacking in the modern diet would modulate pressor and hypercalciuric effects of excess of sodium chloride [36].

Excess dietary protein with high acid renal load may decrease bone density if not buffered by ingestion of supplements or foods that are alkali rich [37]. However, adequate protein is necessary for prevention of osteoporosis and sarcopenia; therefore, increasing the amount of fruit and vegetables may be necessary rather than reducing protein [38].

4. Alkaline Diets and Muscle

As we age, there is a loss of muscle mass, which may predispose to falls and fractures. A three-year study looking at a diet rich in potassium, such as fruits and vegetables, as well as a reduced acid load, resulted in preservation of muscle mass in older men and women [39]. Conditions such as chronic renal failure that result in chronic metabolic acidosis result in accelerated breakdown in skeletal muscle [40]. Correction of acidosis may preserve muscle mass in conditions where muscle wasting is common such as diabetic ketosis, trauma, sepsis, chronic obstructive lung disease, and renal failure [41]. In situations that result in acute acidosis, supplementing younger patients with sodium bicarbonate prior to exhaustive exercise resulted in significantly less acidosis in the blood than those that were not supplemented with sodium bicarbonate [42].

5. Alkaline Supplementation and Growth Hormone

It has long been known that severe forms of metabolic acidosis in children, such as renal tubular acidosis, are associated with low levels of growth hormone with resultant short stature. Correction of the acidosis with bicarbonate [7] or potassium citrate [43] increases growth hormone significantly and improved growth. The use of enough potassium bicarbonate in the diet to neutralize the daily net acid load in postmenopausal women resulted in a significant increase in growth hormone and resultant osteocalcin [44]. Improving growth hormone levels may improve quality of life, reduce cardiovascular risk factors, improve body composition, and even improve memory and cognition [45]. As well this results in a reduction of urinary calcium loss equivalent to 5% of bone calcium content over a period of 3 years [46].

6. Alkaline Diet and Back Pain

There is some evidence that chronic low back pain improves with the supplementation of alkaline minerals [47]. With supplementation there was a slight but significant increase in blood pH and intracellular magnesium. Ensuring that there is enough intracellular magnesium allows for the proper function of enzyme systems and also allows for activation of vitamin D [48]. This in turn has been shown to improve back pain [49].
7. Alkalinity and Chemotherapy

The effectiveness of chemotherapeutic agents is markedly influenced by pH. Numerous agents such as epirubicin and Adriamycin require an alkaline media to be more effective. Others, such as cisplatin, mitomycin C, and thiopeta, are more cytotoxic in an acid media [50]. Cell death correlates with acidosis and intracellular pH shifts higher (more alkaline) after chemotherapy may reflect response to chemotherapy [51]. It has been suggested that inducing metabolic alkalosis may be useful in enhancing some treatment regimes by using sodium bicarbonate, carbicab, and furosemide [52]. Extracellular alkalization by using bicarbonate may result in improvements in therapeutic effectiveness [53]. There is no scientific literature establishing the benefit of an alkaline diet for the prevention of cancer at this time.

8. Discussion

The human body has an amazing ability to maintain a steady pH in the blood with the main compensatory mechanisms being renal and respiratory. Many of the membranes in our body require an acid pH to protect us and to help us digest food. It has been suggested that an alkaline diet may prevent a number of diseases and result in significant health benefits. Looking at the above discussion on bone health alone, certain aspects have doubtful benefit. There does not seem to be enough evidence that milk or cheese may be as detrimental as Remer’s formula suggests since phosphate does benefit bone health and result in a positive calcium balance. However, another mechanism for the alkaline diet to benefit bone health may be the increase in growth hormone and resultant increase in osteocalcin. There is some evidence that the K/Na ratio does matter and that the significant amount of salt in our diet is detrimental. Even some governments are demanding that the food industry reduce the salt load in our diet. High-protein diets may also affect bone health but some protein is also needed for good bone health. Muscle wasting however seems to be reduced with an alkaline diet and back pain may benefit from this as well. An alkaline environment may improve the efficacy of some chemotherapy agents but not others.

9. Conclusion

Alkaline diets result in a more alkaline urine pH and may result in reduced calcium in the urine, however, as seen in some recent reports, this may not reflect total calcium balance because of other buffers such as phosphate. There is no substantial evidence that this improves bone health or protects from osteoporosis. However, alkaline diets may result in a number of health benefits as outlined below

1. Increased fruits and vegetables in an alkaline diet would improve the K/Na ratio and may benefit bone health, reduce muscle wasting, as well as mitigate other chronic diseases such as hypertension and strokes.

2. The resultant increase in growth hormone with an alkaline diet may improve many outcomes from cardiovascular health to memory and cognition.

3. An increase in intracellular magnesium, which is required for the function of many enzyme systems, is another added benefit of the alkaline diet. Available magnesium, which is required to activate vitamin D, would result in numerous added benefits in the vitamin D apocrine/exocrine systems.

4. Alkalinity may result in added benefit for some chemotherapeutic agents that require a higher pH.

From the evidence outlined above, it would be prudent to consider an alkaline diet to reduce morbidity and mortality of chronic disease that are plaguing our aging population. One of the first considerations in an alkaline diet, which includes more fruits and vegetables, is to know what type of soil they were grown in since this may significantly influence the mineral content. At this time, there are limited scientific studies in this area, and many more studies are indicated in regards to muscle effects, growth hormone, and interaction with vitamin D.

References


SUGAR STILL CAUSES TOOTH DECAY, AND NONE OF US IS IMMUNE!
Patient Handout

• A twenty eight year old man keeps himself awake on his graveyard shift job by sipping Coca-Cola all night long. Not much, just one or two cans a night, but sipping continuously. Result – Rampant tooth decay, leading to crowns, root canals, and lost teeth! (Others have done the same with sweetened coffee or tea – honey, molasses, syrup all have the same effect!)

• A seventeen year old girl decides that energy bars are food, and nibbles on them all day long. Result – Rampant tooth decay, and a whole new round of fillings!

• A forty four year old man quits smoking and starts chewing gum, with sugar. He keeps some going most of the day. Result – Rampant tooth decay requiring thousands of dollars in dental work! Dried fruit and raisins do the same!

What you should notice from these examples is that the amount of sugar is not as important as the frequency – how often you have it in your mouth. The reason for this lies in

The biology of tooth decay

Tooth decay is a disease caused by specific bacteria, called Streptococcus mutans. If you have ever had a cavity, Strep mutans is in your mouth, and you are susceptible to new tooth decay. Many bacteria don’t process their food into carbon dioxide and water, as we do in our “aerobic metabolism.” Instead they “ferment” their foods into other kinds of waste products, such as alcohols or acids. Strep mutans lives in microscopic colonies on the surface of the teeth, and has the distinction of being able to produce such concentrated acid waste that it can dissolve the tooth enamel on which it sits. In other words, these germs burn holes in teeth, and all they need is their favorite fuel – sugar!

The Twenty Minute Rule: Each time you put something sugary in your mouth, these germs suck it right up. Each feeding gives them fifteen or twenty minutes of fuel, from which they excrete acid waste. If you eat a candy bar in one sitting, you have fed your germs once. If you take one bite, another bite fifteen minutes later, and finish it twenty minutes after, you have fed them three times with the same candy bar! If you sip a can of Coke over a period of two hours, you feed them continuously! It’s better to eat it down and rinse your mouth. Don’t nibble, sip or snack sugary foods, or any other simple carbs.

The bottom line

The more frequently you eat or drink something sugary, the more you feed your tooth decay–causing bacteria, and the more likely you are to get cavities. So watch out for new sugar eating habits! Non–nutritive sweeteners like xylitol, saccharine and Nutri–Sweet may have their problems, but they don’t contribute to tooth decay. Xylitol is actually protective.
Antitoxic Program

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**Biological Support**

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**Explanation of IAOMT position:** This SR is intended as a framework through which a comprehensive and organized Anti-Toxic Program may be developed to clarify and define this difficult medical and dental discipline. As such, this SR should be a living, changing document, as new information is available.

**Name of Scientific Review:** Antitoxic Program

**Alternative name(s) of Scientific Review:** Detoxification and/or Biologic Support

**This Scientific Review is related to:** Medicine & Dentistry

**This Scientific Review is a:** Procedure or Products

**Purpose of the Scientific Review:** To clarify the issue understood as detoxification in medicine and biologic support in dentistry. In this SR the word “toxic” is used to include anything that may adversely effect the health of the body in any way.

**Scientific Review History:** Prior to this, there was an original Standard of Care of 9/20/96, there was no known broad spectrum program dealing with effects that dental substances may have during or after placement or use in a patient’s oral cavity by dentists.

**A brief description of the Scientific Review:** The establishment of parameters for the evaluation of products and/or procedures intended to prevent or neutralize exposure and/or counter the potential adverse effects of dental substances and materials.

**A specific description of this Scientific Review:** See "Appendix A"

**Manufacturer(s):** N/A

**Scientific Literature:** See "Appendix B"

**Legal Aspects of this Scientific Review:** In medicine and dentistry, the health professional, in doing “no harm”, has been morally, ethically and legally responsible for their actions. The lone exception has been in the effects of dental materials used and placed in the mouth. The act of placing has always been under scrutiny but not the effects of the placed materials itself. This is rapidly changing and some materials are presently recognized as a problem by some state laws. Professional dental judgement is guided by the “Practice Parameters of the American Dental Association” (see that Scientific Review).

**APPENDIX A.**

The IAOMT Anti-Toxic Program is based on five PARAMETERS. The parameters herein established are applicable to human exposure to any substance or material used in dentistry that may adversely effect any body function.

**PARAMETERS**

I. **RISK EVALUATION**
   A. Laboratory Testing: Pre through post amalgam removal
      1. Blood
      2. Urine
      3. Stool
      4. Hair
      5. Porphyrin
6. Material Reactivity
7. Mercury Vapor
8. Galvanism

B. Standards
1. Exposure
2. Body Burden

C. Symptomatology
1. Medical Sign & Symptoms
2. Exposure History
   a) Acute
   b) Chronic

II. PREVENTION:
A. EXPOSURE PREVENTION: Hg example: IAOMT Standards of Care for removal of dental amalgam.
B. ABSORPTION PREVENTION: Hg example: Activated charcoal.
C. DAMAGE PREVENTION: Hg example: Anti-oxidants protect against mercury induced free radical damage.

III. ELIMINATION:
A. PHARMACEUTIC: Hg example: DMPS, DMSA, etc.
B. NON-PHARMACEUTIC: Hg example: Sweat therapy.

IV. NEUTRALIZATION: Reduction of toxic properties by chemical changes induced in the body producing compounds that are less toxic. Hg example: Selenium bound to mercury renders the mercury less bio-available.

V. RESTORATION: Reconstruction to effect a return to a previous state, as of health. Hg example: It has been demonstrated that body levels of selenium and glutathione are depleted by mercury.

APPENDIX B.

DEFINITIONS

ANTAGONIST: A substance that tends to nullify the action of another (1). [In physiology] Any agent, such as a drug or muscle, that exerts an opposite action to that of another or competes for the same receptor sites (2). Heavy metal antagonists possess the common property of forming complexes with heavy metals and preventing or reversing the binding of metallic cations to body ligands; these drugs can also be other heavy metals e.g. selenium antagonizes arsenic (3, page 1615).

ANTI-, ANT-: A prefix signifying against or over against (1).

ANTIDOTE: A remedy for counteracting a poison. Fantus' antidote, once used for mercury poisoning, consisted of calcium sulfide solution IV. Hall antidote, a solution of 7.35 parts potassium iodide and 4 parts quinine hydrochloride in 480 parts water, was once used as an antidote for mercuric chloride poisoning (1). A drug or other substance that opposes the action of a poison. An antidote may be mechanic, acting to coat the stomach and prevent absorption; or chemical, acting to make the toxin inert; or physiologic, acting to oppose the action of the poison, as a sedative given to counter ingestion of a large amount of a stimulant (2).

(CHEMICAL) ANTIDOTE: Any substance that reacts chemically with a poison to form a compound that is harmless. There are few true antidotes, and treatment of poisoning depends largely on eliminating the toxic agent before it can be absorbed by the body (2).

ANTIOXIDANT: One of many widely used synthetic or natural substances added to a product to prevent or delay its deterioration by action of oxygen in the air (1).

ANTIOXIDATION: The prevention of oxidation (1).

ANTITOXIC: Effective against a poison; pertaining to antitoxin (1).

BIOTRANSFORMATION: The chemical changes a substance undergoes in the body, as by the action of enzymes (2). A number of enzymes in animal organisms are capable of biotransforming lipid-soluble xenobiotics in such a way as to render them more water-soluble. These enzymatic reactions are of two types: phase I reactions, which involve oxidation, reduction, and hydrolysis; and phase II reactions, which consist of conjugation or synthetic reactions (4, pages 64-65).

CHELATE: To combine with a metal to form a heterocyclic ring structure. By extension, a chemical compound in which a metallic ion is sequestered and firmly bound into a ring within the chelating molecules. Chelates are used in chemotherapy of metal poisoning. (1)

CHELATION: The formation of a heterocyclic ring structure in which the metal ion is associated with a charged or uncharged electron donor referred to a ligand. The ligand may be monodentate, bidentate, or multidentate; that is, it may attach or coordinate using one or two or more donor atoms. Bidentate ligands form ring structures that include the metal ion and the two ligand atoms attached to the metal. To varying degrees, they may mobilize and enhance the excretion of a rather wide range of metals, including essential metals such as zinc. Their efficacy depends not solely on their affinity for the metal of interest, but
CHEMOTHERAPY:
A chemical reaction in which there is a combination with a metal to form a ring-shaped molecular complex in which the metal is firmly bound and sequestered (2).

CHELATING AGENT:
A substance that promotes chelation. Chelating agents are used in the treatment of metal poisoning (2).

DETOXIFICATION:
- Reduction of the toxic properties of a substance.
- Treatment designed to assist in recovery from the toxic effects of a drug (1).

(METABOLIC) DETOXIFICATION:
Reduction of the toxic properties of a substance by chemical changes induced in the body, producing a compound that is less poisonous or more readily eliminated (1).

DETOXIFY:
To remove the toxic quality of a substance (1).

DETOXIFICATION SERVICE:
A hospital service providing treatment to diminish or remove from a patient's body the toxic effects of chemical substances, as alcohol or drugs, usually as an initial step in the treatment of a chemical-dependent person. The service may also be used to remove poisonous substances to which a person may have been exposed (2).

HOMEOSTASIS:
A tendency to stability in the normal body states (internal environment) of the organism. It is achieved by a system of control mechanisms activated by negative feedback; e.g., a high level of carbon dioxide in extracellular fluid triggers increased pulmonary ventilation, which in turn causes a decrease in carbon dioxide concentration (1).

METABOLISM:
The sum of all the physical and chemical processes by which living organized substance is produced and maintained (anabolism), and also the transformation by which energy is made available for uses of the organism (catabolism) (1). The aggregate of all chemical processes that take place in living organisms, resulting in growth, generation of energy, elimination of wastes, and other bodily functions as they relate to the distribution of nutrients in the blood after digestion. Metabolism takes place in two steps: anabolism, the constructive phase, in which smaller molecules (as amino acids) are converted to larger molecules (as proteins); and catabolism, the destructive phase, in which larger molecules (as glycogen) are converted to smaller molecules (as pyruvic acid) (2).

METABOLITE:
A substance produced by metabolic action or necessary for a metabolic process. An essential metabolite is one required for a vital metabolic process (2). Any substance produced by metabolism or by a metabolic process. Essential metabolite, a necessary constituent of normal metabolic processes (1).

PHARMACEUTICAL:
Pertaining to pharmacy or drugs. A medicinal drug (1).

RESTORATION:
Reconstruction to effect return to a previous state, as of health (1).

RESTORATIVE:
Promoting a return to health or to consciousness. A remedy that aids in restoring health, vigor, or consciousness; called also anastatic (1). [IAOMT COMMENT: Certain substances exhibit an altered action dependent upon being in their "d-", "l-" or "racemic" form. This property, dealing with stereochemistry, is explained by the following group of definitions.]

STEREOCHEMISTRY:
The branch of chemistry treating of the space relations of atoms in molecules (1).
- ISOMERISM: The possession by two or more distinct compounds of the same molecular formula, each molecule having the same number of atoms of each element, but in different arrangement (1).
- STEREOISOMERISM: Isomerism in which the compounds have the same structural formula, but the atoms are distributed differently in space (1).
- STEREOSPECIFIC: Exhibiting structural specificity in interacting with a substrate or a limited class of substrates (1).
- OPTICAL ISOMERISM: Stereoisomerism in which an appreciable number of molecules exhibit different effects on polarized light (1).
- OPTICAL ROTATION: The quality of certain optically active substances whereby the plane of polarized light is changed, so that it is rotated in an arc the length of which is characteristic of the substance (1).
- DEXTROROTATORY ("d-"), LEVOROTATORY ("l-"), RACEMIC ("d, l-"),: Turning the plane of polarization of polarized light to the right (1).
- LEVOROTATORY ("l-": Turning the plane of polarization of polarized light to the left (1).

SYSTEMIC:
Pertaining to or affecting the body as a whole (1). Of or pertaining to the whole body rather than to a localized area or regional portion of the body (2).

SYSTEMIC REMEDY:
A medicinal substance that is given orally, parenterally, or rectally to be absorbed into the circulation for treatment of a health problem. Many remedies or medications administered locally or regionally are to some degree absorbed systemically. Medication administered systemically may have various local effects but the intent is to treat the whole body (2).

TOXICANT:
Poisonous. A poisonous agent (1).

(STORAGE OF) TOXICANTS IN TISSUES:
Toxicants are often concentrated in a specific tissue. The compartment where the toxicant is concentrated can be thought of as a storage depot. While stored, the toxicant seldom harms the organism. Storage depots, therefore, could be considered as protective mechanisms preventing the accumulation of high concentrations of the toxicants at the site of toxic action. The toxicants in these depots are always in equilibrium with free toxicant in plasma, and as the chemical is biotransformed or excreted from the body, more is released from the storage site. The bound form of the chemical is not available to enter the target organ to produce injury. However, it has been demonstrated that another chemical agent may displace the first from plasma proteins, making it available in the free form. In this way a second chemical can induce
toxicity from the first chemical. All body secretions appear to have the ability to excrete foreign compounds; toxicants have been found in sweat, tears, and milk (4, pages 39-44).

**TOXICATION:** Poisoning (1).

**TOXICO-, TOXO-:** A combining form meaning, "pertaining to poison, poisonous" (2).

**TOXICOLOGIST:** A specialist in toxicology (2).

**TOXICOLOGY:** The scientific study of poisons, their detection, their effects, and methods of treatment for conditions they produce (2).

**TOXICOSIS:** Any disease condition due to poisoning (1).

**RETENTION TOXICOSIS:** That which is due to the nonexcretion of noxious waste products (1).

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**REFERENCES**


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Biophotonic Scanner

| Received: 7/6/03 | Scientific Review: 8/12/03 | Approval: 9/13/03 |
| Scientific Review: | IAOMT Board Review: 9/13/03 | Provisional Approval |
| Re evaluation: 10/24/05 | Biological Support: | No Opinion |
| | | No Approval |

**Explanation of IAOMT position:** Since tissue levels of antioxidants are essential for minimizing the impact of free radical damage, we now have an instrument that can measure such levels. This is an important advance in biological support.

**Name of SR:** Biophotonic Scanner

**Alternative name of SR:** Pharmanex Biophotonic Scanner

**This SR is related to:** Medicine & Dentistry

**This SR is a:** Procedure & Equipment

**Do you have a vested financial interest in any part of this SR?** Yes

**Purpose of this SR:** The Biophotonic Scanner is used to measure Carotenoid (one of many antioxidants) levels in living human tissues as a reflection of defenses against free radical damage to living cells.

**SR History:** Six years of research, funded by NIH & National Science Foundation with several published peer reviewed papers validating its accuracy.

**Briefly describe the SR:** The Scanner measures the levels of total Carotenoid antioxidant levels in the palm of one’s hand using a soft laser calibrated at 473 nanometers. The Carotenoid family of antioxidants (18 occur in human tissues) have a unique “optical fingerprint” and reflect back at 510 nanometers. This particular shift in the reflected light from the carotenoid molecules is specific and unique to this family of antioxidant molecules. From this data, a “body defense score” is reported through computer software in less than 3 minutes. This is a measure of the total carotenoid concentration in the tissues and is highly reproducible. The fundamental basis of this measurement, “biophotonics”, utilizes Resonance Raman Spectroscopy, a noninvasive optical method that won Sir Raman the Nobel Prize in physics. I refer to the website www.evergreen8.com for a more in depth examination of the methodology. Because this technology measures tissue levels of carotenoids, it reveals the action of these antioxidants at their site of action. Prior technologies allowed antioxidant measurements of the blood, but because blood levels reflect dietary intake of only the last few meals, it did not reflect long-term levels. The tissue levels as measured with the scanner reflect long term (12 to 16 weeks) exposures, a much more accurate assessment for risk factor analysis. Furthermore, while the carotenoids are the only molecules specifically detected with this particular application of biophotonics, it has been shown that the carotenoid levels thus detected do reflect the overall antioxidant status of the tissues. (Packer 1993)

**Specifically, by outline if appropriate, describe the SOC/SR:**

1. The person to be examined first fills out a brief data collection form as to age, sex, race, weight, number of fruits & vegetables consumed on average day, nature of supplements, etc.
2. The person’s hand is properly positioned on the scanner for approximately 2 minutes at which time the “Body Defense Score” is displayed on the attached laptop computer.
3. The range of scores currently measured from 0 to 88,000. The higher the score the greater the antioxidant saturation of the tissue, and the lower the score is a measure of increased oxidative stress (Smidt & Shieh, 2003)

**Manufacturer:** Pharmanex

**Scientific Literature:** Peer reviewed studies and patent are viewable on website www.evergreen8.com, click on “antioxidant scanner” then scroll down to “references for medical professionals”. Also see the accompanying article by Lester Packer.

**Legal Aspects of this SOC/SR:** The Scanner cannot make DIAGNOSIS of any specific disease. This measures a RISK FACTOR for cellular damage and related degenerative diseases.
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| **IAOMT Member #:** 027 | **IAOMT Chapter:** North American |
Chlorella

**Explanation of IAOMT position:** Although on the surface this appears to be a good nutrient (food) to help patients cope with mercury released from dental amalgams that ends up in their bodies. The IAOMT has many concerns. A few of these are:

- Most of the purpose of the SOC deals with medical treatment, outside of dentistry
- Although research is cited, the source and quality is questionable at best: much of the cited science is opinion and not peer adjudicated
- As chlorella binds heavy metals in nature, this nutrient source is laced with unwanted and potentially hazardous factors
- If Vitamin C is added to chlorella and distilled water, mercury is detected on a mercury vapor analyzer
- There seems to be many patients that have experienced adverse effects including inability to lower mercury levels on DMPS provocation to acceptable levels

Until such questions are answered, the IAOMT has significant reservation on chlorella’s use in detoxification. Is this a “food” or nutritional supplement to support body health or enhance detoxification? These questions are important depending on whether it is used by a dentist or physician.

**Name of Scientific Review:** Chlorella

**Alternative name(s) of Scientific Review:** n/a

**This Scientific Review is related to:** Medicine & Dentistry

**This Scientific Review is a:** Product & Procedure

**Do you have a vested financial interest in this Scientific Review?** No

**Purpose of the Scientific Review:** Chlorella stimulates the immune system, improve digestion and elimination, detoxify the body, enhance tissue growth and repair, accelerate healing, help prevent degenerative disease and promote longer life.

**Scientific Review History:** Chlorella Pyrenoidosa was identified around the 19th century. The Japanese began studying it more closely in the 1940’s and are responsible for much of chlorella’s popularity today. The Japanese take more chlorella per capita than American’s take vitamin C, America’s most popular vitamin. However, chlorella is many times more powerful a whole food than any other multi-vitamin or supplement on the market. It is slowly becoming more widely known as it’s astounding and profound health benefits are revealed though scientific study and word of mouth.

**Briefly describe the Scientific Review:** Chlorella contains vitamin A, B1, B2, B6, C, E, K, niacin, pantothenic acid, folic acid, and minerals such as calcium, magnesium, iron, zinc, phosphorous, iodine, and the highest percentage of chlorophyll of any known plant source. It also has nucleic factors (DNA & RNA) that stimulate tissue repair and speed up healing.

The cell wall of chlorella also has a beneficial effect. When used as a food, fragments of the cell wall adhere to and remove heavy metals like cadmium, lead and mercury from the body. It takes approximately 3-6 months for heavy metals to begin to be removed from the blood depending on the amount of chlorella being taken.

**A specifically, by outline if appropriate, describe the Scientific Review:**

Amalgam removal detox protocol (according to Klinghardt, D., Williams, L.)
- Begin protocol at least 2 weeks prior to first mercury amalgam removal appointment and continue for at least 3 months after. Chlorella should be taken indefinitely.
- Chlorella supplementation can range from one half a capsule to a maximum of 14 capsules daily, depending on individual tolerance. Too high a dose will cause symptoms of nausea, heartburn, diarrhea and headache.
- For the first 8 days, take chlorella with meals at your maximum tolerance level, dividing it into smaller doses throughout the day
- On days 9 & 10 take 10 times the usual dose but no more than 60 capsules in a single day
- Days 11 & 12 are a “rest” period and no chlorella should be taken
- The 13 day begin the 12 day cycle again until all the amalgams have been removed and the body burden is at an acceptable level as determined by DMPS provocation.

**Maintenance Dosage**

Three grams per day is a good maintenance dose of chlorella for a person to take. With this amount no significant changes will be noticed, however, the body will get many of the nutrients it must have to function properly such as amino acids (protein), vital minerals, vitamins, carbohydrates and enzymes. Persons taking 5-7 grams per day is quite common and at this level will notice significant changes in digestion, energy and over-all health.

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<tr>
<td>The Watershed, 517-886-0440</td>
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<td>Bio-Life Too, 3600793-8991</td>
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<td>Heartsources, Inc., 800-242-5751</td>
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<td>Nature’s Balance, 800-858-5198</td>
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<td>Emerson Ecologics, 800-654-4431</td>
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**Scientific Literature:** Contact applicant

**Legal Aspects of this Scientific Review:** Chlorella is one of the most scientifically researched foods in human history. The research has come from all over the world by scientist at universities, private industry, and chlorella manufacturers themselves. Not a single negative aspect of chlorella has ever been cited

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# Clay Use as a strong Broad-Spectrum Antibacterial (De-Bugging) Agent and Detoxification Vehicle

| Received: 2.8.09 | **Biological Support** | Provisional Approval: 3.26.09 |
| Scientific Review: 3.9.09 | Clay Use as a strong Broad-Spectrum Antibacterial (De-Bugging) Agent and Detoxification Vehicle | Provisional Approval: 3.26.09 |
| IAOMT Board Review: 3.26.09 | | No Approval |
| Reevaluation & Update | | |

**Explanation of IAOMT position:** As explained by the author: “I have reviewed most if not all SR’s and have not found one SR dealing with this effeectly with intraoral antibacterial elimination as well as detoxification of heavy metals particularly Hg.”

- **Strengths:** Clay has been used instinctively and purposefully for detoxification, healing and as a nutritional supplement by a large number of people and animals for countless centuries.
- **Weaknesses:** Since clay has been used for so long and for so many reasons, SR limited to two of the most common uses.

The two most powerful uses of clay: **STRONG BROAD-SPECTRUM ANTIBACTERIAL FUNCTION (De-Bugging) and very effective in DETOXIFICATION.**

**Important:** See Legal

**Name of Scientific Review:** Clay use as a strong Broad-Spectrum Antibacterial (De-Bugging) agent and Detoxification Vehicle

**Alternative name(s) of Scientific Review:** Exceptional Healing from Ground Up

**This Scientific Review is related to** Medicine and Dentistry

**This Scientific Review is a** Product & Procedure

**Do you have a vested interest in any part of this SR?** Yes, I am the president and founder of DermaClay, LLC. DermaClay is a company that sells clay products globally to healthcare practitioners for their own personal health use as well as handling it for their patients so they can use clay for detoxification and broad-spectrum antibacterial “de-bugging” purposes.

**Purpose of the Scientific Review:** To summarize the value of clay functioning as a strong broad-spectrum antibacterial, and detoxifier agent

**Scientific Review History:** The age of our universe is estimated to be about 12.5 billion years old and earth is estimated to be 4.5 billion years old. That estimation was calculated by NASA Chief Historian Mr. Stephen J. Nick (www.NASA.GOV). In the early part of earth's formation, clay was formed as a result of volcanic eruptions. These eruptions produced high reaching clouds of volcanic ash as well as many lava runs. In the end, clay covered 80% of the earth's ground surface.

Early animals and primitive people learned to use clay externally and internally for healing, detoxification and nutrition. (31, 33, 34) One of the better studies is the research into the behavior of the "Parrots of the Amazon" (32).

Clay has been in medicinal use since the earliest dawn of medical history. Researchers JoAnn Scurlock and Burton Anderson, studying early texts in "cuneiform" writing, found that physicians of ancient Mesopotamia used clay as their principal curative agent. Records show that between 3500 BC-150 AD physicians/priests treated over 300 documented ailments with natural desert clay in the same fashion as is recommended today (1).

Ancient tribes of the high Andes in central Africa and Aborigines of Australia used clay as a dietary staple, a supplement and as a curative for healing purposes.
Early French cultures were known to use clay for nutritional and medicinal purposes. One of the reasons they used it was for healing of gum disease.

There are many Biblical references explaining clay use as well.

Native Americans call clay "Ee-Wah-Kee", meaning the "Mud that Heals".

It is to Dr. Julius Strumph of Wurzburg that we owe the re-introduction of its use as medication in 1898 (2).

Nineteenth century naturopath Sebastian Kneipp, and fellow naturalist Adolph Just, had clay therapy in a prominent position in their arsenal of Holistic Medicine, due to the tremendous results they achieved using it.

Then clay fell out of favor until French naturopath Raymond Dextreit in 1974 wrote the book, "Our Earth, Our Cure". That book was translated to 8 languages and sold over 980,000 copies. (3)

A brief description of the Scientific Literature Review: Search out scientific information about clay use as a strong broad-spectrum antibacterial and detoxification vehicle in healthcare.

A specific description of this Scientific Literature Review:

Explaining the Clay Particle and its broad-spectrum antibacterial and detoxifying function.

In order to fully understand the extremely incredible healing and detoxifying power of clay, it is necessary to understand the clay particle. There are seven distinct families of clay and thousands of clay mineral combinations. Only a handful of clay types are suitable for health and healing treatment purposes. This paper will concentrate on the smectite family of clay, with particular emphasis on calcium bentonite clay (CBC) as the clay of choice.

In nature the CBC clay particles would look like a stack of credit cards with a tiny space between each. One CBC clay particle would look like two credit cards on top of each other with the flat sides against each other and a tiny space in between them. This is an example of how one CBC clay particle would appear. The flat sides are negatively charged and the thin edges are positively charged. Functionally, the ionic charge of pure, natural (in this case) calcium bentonite clay (CBC) is 100% negative. The clay particle is extremely negatively charged.

Dr. Robert T. Martin, Ph.D., Cornell University, and mineralogist, MIT stated that "one gram of clay has a surface area of 800 square meters or in our common terms it adds up to 10 football fields" (4) of negative pulling power. This powerful magnetic force acts with equal ferocity toward positively charged heavy metals, toxins and poisons as well as positively charged bacteria, viruses, molds and fungi etc. Since most everything that attacks our bodies- bacteria, viruses, fungi, diseases, toxic chemicals, toxic heavy metals etc. is of positive ionic charge (5), it is not hard to see why clay is so successful at eliminating bad bacteria as well as toxins from our bodies. In the same report, Dr. Martin makes an important statement that every serious user of clay is aware of: that "to obtain maximum effectiveness in the human body clay should put in a liquid colloidal-gel state. This is why clay cannot be made into tablet form." (6) Dextreit states further on in his book that "It is possible to mix it with a little water in order to form small balls like peas and let them dry. Swallow these instead of clay powder." (7, 24)

A. How does clay work?
In addition to the large negative surface area, calcium bentonite clay has several other critically important detoxification and antibacterial properties, including adsorption and absorption. These two words sound quite similar but in reality are very different. Adsorption is the quality of the clay that binds toxins and bacteria to its outer self. The outer surface of the clay draws positively charged ions like a magnet and binds them to itself like "Velcro®." Once adsorbed, the attracted particles are then absorbed into the inner layer of the clay like a sponge. The clay then undergoes a swelling phase, which allows the clay particle to adsorb and absorb materials into itself by several times its own weight.

B. How does clay detoxify?
Once the clay has adsorbed and absorbed and swelled to its limits, it is time to do its final task, exit the system. It is important to realize that we are talking about eliminating very toxic materials like mercury, paraquat (35), lead, cadmium, chromium (8), and aflatoxins (9, 10, 11, 27), that are harmful by-products of mold growth and are potentially fatal to people, and secondary plant products like tannic acid (12) that are dangerous to some animals and always dangerous to people.
Because clay absorbs the toxins into itself, they are prevented from being re-released back to into the body as the clay exits the system (13). Since the epithelial lining of our intestinal system is negatively charged, same as the clay, the clay itself is NOT absorbed into our bodies. Like charges repel each other.

In the early 1900's, Dr. Alexis Carrel of the Rockefeller Institute for Medical Research performed an amazing experiment. He managed to sustain the life of cells from a chicken embryo by immersing them in a solution containing all the nutrients necessary for life, changing the solution daily. The cells took up nutrients from the nutrient rich broth and excreted their wastes into the same solution. **The only thing Dr. Carrel did each day was discard the old solution and replace it with a fresh nutrient solution.** Normally chickens live an average of 7 years. Dr. Carrel's chicken cells lived for 29 years, until one night Dr. Carrel's assistant forgot to change the polluted solution. Dr. Carrel concluded at the end of his experiment that the cell is actually immortal. It is merely the fluid in which it resides which degenerates. He was quoted saying,

"**The cell is immortal, renew this fluid at intervals (Detoxify) , give the cell something on which to feed and, so far as we know, the pulsation of life may go on forever**" (14).

Applying that principal to today, it means that by detoxifying daily a person may remain healthier much longer with a better quality of life.

"The trick in recovering from a heavy metal poisoning is getting the heavy metals out of the body without killing the patient or flushing his IQ down the toilet. (15)

How does clay destroy the bacteria or as we say it "De-Bug" the body?
As you may remember from part A above, bacteria, viruses, yeasts and fungi are all positively charged. That means that they are hopelessly drawn into the highly negatively charged clay particles. Some of the most dangerous and lethal bacteria that have evolved into antibiotic resistant strains appear to have no survival mechanism against clay.

This research was reported in Science Daily October 26, 2007:
Rossman Giese, Ph.D., professor of geology in UB's College of Arts and Sciences and Tracy Bank, Ph.D. assistant professor of geology at UB were using several techniques to study clays including atomic force microscopy. "We looked at the attraction or repulsion between natural and modified clays and bacteria," said Giese. "Unlike antibiotics, which are essentially a chemical weapon against bacteria, broad-spectrum antimicrobial clays kill through purely physical means", he explained. "The bacterium has to come into physical contact with the clay in order for something to happen", Giese said. That contact turns deadly. "The antimicrobial agent in the clay pokes a hole in the cell wall of the bacterium causing the bacterium to leak to death," he explained. "The nice thing about that is that there is no way that the bacterium can evolve to avoid it, so resistance to the antimicrobial clay is unlikely to become a problem." (16, 26)

Shelley Haydel, Ph.D., a microbiologist at Arizona State University recently performed a very interesting experiment. When she added volcanic clay, called "agricur", to cell colonies of MRSA (Methicillin resistant Staphylococcus aureus), she found that 99% of the colonies were eliminated within 24 hours. In the same time period, colonies not treated with the clay grew 45%. The clay exhibited similar antibiotic effects against Salmonella, penicillin resistant S. aureus (PRSA), pathogenic escherichia Coli and Buruli, the flesh-eating relative of Leprosy that destroys the immune system, skin, tissues and bones causing disfigurement of children (17, 28, 29). We need to remember that MRSA killed over 18,650 people in USA alone in 2005. (30)

“Clays are little chemical drug-stores in a packet” said Dr. Lynda Williams, Ph.D., a geochemist also from Arizona State University of the School of Earth & Space Exploration in Tempe, Arizona.(18) She continues,

“**So far, clay killed everything we tested**”. (19)

C. What are the components of clay?

The three primary minerals of calcium bentonite clay are as follows:

silica 40%
calcium 28%
magnesium 12%

It is no accident that in the human body, the three primary minerals are as follows:

silica 42%
calcium 28%
magnesium 12%

In addition to the above 3 primary minerals there are 71 additional minerals found in a typical sample of montmorillonite clays.
In his book "Our Earth, Our Cure" French naturopath Raymond Dextreit describes clay as a "greasy sort of earth" (21).

For helping to prevent the proliferation of pathogenic germs and parasites to aiding with rebuilding of healthy tissues and cells, clay is a "living cure." (22)

Manufacturer(s): Since clay covers over 80% of the earth's surface, it is available in many countries and is being sold by many companies. Caution must be exercised when selecting clay for healing purposes. Processed clay has been heated to high (900°C) temperatures resulting in mere energy-less mud. (25) Always look for pure, natural unadulterated clay for health improvement purposes.

Here are some manufacturers and/or distributors of pure, natural unadulterated clay:

LL Magnetic Clay: www.magneticclay.com
Living Clay: www.livingclayco.com
Eytons Earth, www.eytonsearth.org
Enviro Health Intl. LLC www.envirohealthproducts.com
Natures Purity: www.naturepurity.com

Scientific Literature: Since clay has been with us from the birth of civilization, it has been studied and researched for a very long time. This review is limited to studies and books written relatively recently and used here in our project and so footnoted. Please refer to the bibliography and references at the end of this SR.

Legal Aspects of this Scientific Review: Today, bentonite clay is increasingly used both internally and externally by those interested in natural remedies, and it is included on the FDA's famous "GRAS" list. "GRAS" stands for "Generally Recognized as Safe". According to FDA, items on the GRAS list are not subject to pre-market review and do not need FDA approval before release to the public. (23)

Standards of Care: for dentistry, does not have a policy how to deal with detoxification of heavy metals or other dental related chemicals. When it comes to antibacterial intraoral treatments the Standard of Care promotes & is the use of antibiotics (AB). (Patient needs to be informed that it is our responsibility to offer them the AB’s. If patient refuses the use of AB’s we as healthcare practitioners need to write it into patient’s treatment record.) It has been clearly demonstrated that antibiotics are losing their value as an effective antibacterial chemical since more and more bacteria are becoming totally resistance to them. Alternative healthcare practitioners who have chosen to use something else other than antibiotics often use grape seed extract, ozone and/or colloidal silver. Now they have another way to deal with highly resistant bacteria.

The risk that practitioners will have in the beginning is that very few people know about clays powerful use for broad-spectrum antibacterial and detoxification purposes.

Since we are dealing with an unprocessed, 100% natural, pure clay to be used in home care settings in a similar way tooth paste (which also have clay in it) and mouth washes are used, we have found it to be un-necessary to add its use to our present “Informed Consent” forms.

Bibliography and References:

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6. Abehesera, Michael; "The Healing Power of Clay"; Page 9
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19. Williams, Lynda, Ph.D; American Chemical Society; April 15, 2008
21. Dextreit, Raymond & Abeshera, Michael; “Our Earth, Our Cure”; Page 11
22. Abeshera, Michael; “The healing Power of Clay”; Page 19
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30. Haydel, Shelley, Ph.D., “US Centers for Disease Control and Prevention”
32. Gilardi, James, Ph.D.; “Parrots that Eat Dirt” Eatonsearth.com
35. IPCS International Programme on Chemical Safety; “ PARAQUAT, Health and Safety Guide No 51; WHO 1991

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Unit 4 OPTIONAL IAOMT Accreditation Materials as of December 18, 2017; Page 23
# Coenzyme Q10

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## Scientific Review

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## Biocompatible Periodontal Therapy

## Explanation of IAOMT position:

### Name of Scientific Review: Coenzyme Q10

### Alternative name(s) of Scientific Review: Ubiquinone

### This Scientific Review is related to Dentistry

### Purpose of the Scientific Review:

**Scientific Review History:** CoQ10 was discovered as the enzyme of Succinate Dehydrogenase CoQ10 reductase. Dr. Carl Folkers termed the metabolic pathways in which CoQ10 participates "bioenergetics". Studies have been conducted in several countries since 1967. The initial source was from beef hearts which made the enzyme very expensive. A production source was found in Japan using fermentation, and the cost became reasonable for mass marketing.

**A brief description of the Scientific Review:** To provide therapeutic levels of Coenzyme Q10 (CoQ10) to enhance healing of periodontal tissues and to supply the patient with enhanced free radical scavenger ability and energy production. Both systemic and topical doses have resulted in significant improvement of periodontal tissue health. Therapeutic doses range from 30 to 100 mg per day. There is also evidence of CoQ10 use to boost the immune system and aid in the healing process after surgery. To date there have been four international scientific symposiums on CoQ10. Studies have shown a decline in COQ10 as we age by as much as 80%; with disease states the affected tissues show a dramatic drops in CoQ10 concentrations.

**A specific description of this Scientific Review:** Instruct the patient to take from 30 to 100 mg per day of CoQ10 (base dose on severity of symptoms). Dosage should be split for 2 times per day. Therapeutic dose should be maintained from 3 weeks to 2 months. maintenance dose of 30 to 60 mg per day is recommended.

**Manufacturer(s):** Capsules available through many sources

**Scientific Literature:** See "Appendix A" (contact applicant below). The booklet *Coenzyme Q10* by William Lee, P.Ph., PhD., and *The Miracle Nutrient Coenzyme Q10* by Emile Bliznakov, MD

**Legal Aspects of this Scientific Review:** CoQ10 has been shown to be effective in the treatment of periodontal disease in several scientific studies. Studies on adverse reactions with a maintenance dose of 30 gm per day shows less than 0.5% occurrence of side effects. These include: epigastric discomfort, nausea and diarrhea. CoQ10 is considered essential for optimum health of all cells, tissues and organs of the body. The other term for CoQ10, Ubiquinone, is from the word ubiquitous, because the enzyme is found in all the cells of the body.

In the rare case of known hypersensitivity to CoQ10, it is contraindicated. During the history or before recommendation, inquiry should be made of the patient.

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**Office FAX:**

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### DMSA Chelation Therapy in Dentistry

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**Explanation of IAOMT position:** It is important that the IAOMT be very clear that this product is not to be used by dentist unless thoroughly evaluated by your licensing governing body with written verification. It is here for information purposes only. Note that it has **No Approval**.

Besides the need for better long-term studies, the scientifically unanswered question that: DMSA passes through the “blood/brain barrier” and “actually opens it up”. No science has been found to support or deny this notion. However, if this is true, then extreme caution should be used, especially in neurologically compromised patients, for any osmotic gradient will pass mercury into neurological tissues compounding the problems.

**Name of Scientific Review:** DMSA (meso-2,3-dimercaptosuccinic acid) Chelation Therapy in Dentistry

**Alternative name(s) of Scientific Review:** Mercury Detoxification Using DMSA (meso-2,3-dimercaptosuccinic acid) Chelation Therapy in Dentistry

**This Scientific Review is related to:** Dentistry

**This Scientific Review is a:** Product & Procedure

**Do you have a vested financial interest in this Scientific Review?** No

**Purpose of the Scientific Review:** To clarify the role of DMSA as a pharmaceutical elimination technique in mercury detoxification. To provide information to aid the dentist in advising patients and other health care practitioners of treatment for mercury toxicity during and following the removal of mercury amalgam dental restorations.

**Scientific Review History:** A wide range of techniques is currently being used to reduce the patient’s body burden of mercury. Of the many techniques, medications (supplements, herbal, homeopathic remedies, chemicals) and methods, to date, none have emerged as the “treatment of choice.” The use of DMSA as an antioxidant is advocated as part of a more comprehensive support program because of its effectiveness and limited number of side effects.

**Briefly describe the Scientific Review:** The use of prescribed DMSA as part of a detoxification program following the removal of mercury amalgam dental restorations.

**A specifically, by outline if appropriate, describe the Scientific Review:** See “Appendix A” summary. For the complete text of “Appendix A” contact the applicant.

**Manufacturer(s), Distributor(s), or Publisher:** Available by prescription as generic “Succimer” or trade name “Chemet” from McNeil Laboratories, but can be manufactured in compounding pharmacies in specific dosages.

**Scientific Literature:** For the complete text of “Appendix B” contact the applicant.

**Legal Aspects of this Scientific Review:** The application of the drug and procedure or the use of DMSA may be beyond the “practice of dentistry” in some legal jurisdictions. This means that administering this compound to your patients for the express purpose reducing their mercury burden may imply the “practice of medicine.” The intention of this Scientific Review is to provide background information for dentist to aid them in communicating with the physician of record, advice on patient protection and detoxification during and following the removal of mercury amalgam dental restorations.
Appendix A
The use of DMSA in a Mercury Antitoxic Program: a summary

There is a growing awareness among health care practitioners and researchers that dental mercury amalgam fillings release a significant amount of mercury. Enough mercury is released to potentially cause health problems, especially in susceptible individuals. Research demonstrates that mercury vapor is continuously released from the amalgam fillings in measurable quantities from the placement (acute) and through the restorations life (chronic).

An indication of mercury exposure risk (Mercury Vapor Risk Factor Analysis, IAOMT SOC) and burden of body tissues can be acquired by hair analysis, urine (provocative IV dose of DMPS or oral DMSA).

What is DMSA? DMSA is an abbreviation for meso-2,3-dimercaptosuccinic acid. It is a FDA approved drug marketed as "Chemet" (succimer) by McNeil Laboratories for the treatment of lead toxicity in children.

How is DMSA administered? Orally

What is the correct dosage? The usual prescription is 25 capsules (specially compounded capsules 500mg each) to be taken one capsule at a time, 3 times a week for 2 months. Chemet is dispensed in 100 mg capsules so the dosage must be adjusted appropriately.

Recent information from Doctor’s Data Inc. suggests that DMSA gives better yields for the provoked urine toxic elements challenge than DMPS if given at 30 mg/kg followed by a 6 hour urine collection (J. Nutr. Envir. Med. (1998) 8. 219-231)

Doctor’s Data then describes the protocol for DMSA therapy as follows:

Two week cycle: 3 days on DMSA (10mg/kg, in divided doses, i.e., t.i.d.). 11 days off drug. Supplement I.V. and/or orally 24-48 hours after last dose (essential elements, SH-containing amino acids, DMSA depletes cysteine). As with any chelating/complexing agent, do not co-administer minerals 24 hours prior to or during drug administration. Re-challenge with I.V. DMPS as described after about every 5 cycles of oral DMSA to monitor progress.

How is DMSA metabolized? About 20% of the administered dose is recovered in the urine. Maximum excretion of DMPS occurred in the 2-4 hour urine specimen.

How safe is DMPS? Adverse reactions are occasional dizziness and weakness plus more rare abdominal distress, gas or pain.

When is the best time to remove mercury amalgam fillings? All mercury should be removed prior to administration of DMSA including those under crowns and onlays.

Why should DMSA be used instead of DMPS? DMSA is approved by the US FDA

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# Hall-V-Tox

## Scientific Review

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## What is this Scientific Review related to?

| XX Medicine | XX Dentistry |  |

## Is this Scientific Review a ....? |

| XX Product | XX Procedure | Equipment | Publication |

## Purpose of the Scientific Review:

To more safely remove dental metals from patients

## Do you have a vested financial interest in any part of this Scientific Review?

No

## Scientific Review History:

None

## Briefly describe the Scientific Review:

To prepare patients, Step by step before amalgam/metal removal under intravenous sodium Ascorbate

### Specifically, by outline if appropriate, describe the Scientific Review:

- Urine/saliva pH
- Medical test as appropriate
- Seal the gut
- Adjust body pH
- Activate Cytochrome P450 then 2° detox system (using V-Tox powder)
- Metal removal under IV Vit C

## Manufacturer(s), distributors, or publisher:

- Merit Pharmaceuticals, Los Angeles, Ca.

## Scientific Literature:

Comprehensive booklet explaining all details are included with application – consult with applicant

## Legal Aspects of this Scientific Review:

You are on your own

## Applicant Name:

Graeme Hall, DDS, Munro-Hall Clinic

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| Office FAX: |  |

## City:

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| Home Phone: |  |

## State of Province:

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| Zip code: | MK43 8TS |

## Country:

United Kingdom

| e-mail: | Hallvtox@dircon.co.uk |

## IAOMT Member #:

| IAOMT Chapter: | North America |

## Explanation of IAOMT position:

Dental application of this Scientific Review is not recommended for dentist in North America. Other dentist must review their legal parameters. It is primarily a medical Scientific Review to aid in detoxification and protection. This program is too lengthy to put in this format. If you would like the information, contact the author.
The IV-C Mercury Tox Program: A Guide for the Doctor

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**Explanation of IAOMT position:** Must reading for information on Vitamin C but be aware that IV administration of Vitamin C is outside the dental standard of care and best be done by physician.

**Name of Scientific Review:** The IV-C Mercury Tox Program: A Guide for the Doctor

**Alternative name(s) of Scientific Review:** A companion handbook to "Chronic Mercury Toxicity: New Hope Against an Endemic Disease"

**This Scientific Review is related to:** Medicine & Dentistry

**This Scientific Review is a:** Publication

**Purpose of the Scientific Review:** Additional Information in abbreviated form

**Scientific Review History:** This Handbook was compiled as the result of suggestions from doctors who agreed with the concept of a companion book, but who had difficulty bridging the gap between concept and practice. It is also the result of suggestions from researchers who need a "cookbook" style manual in order to study the program as a whole.

**A brief description of the Scientific Review:** The companion handbook spells out (for the doctor) in cookbook-like style the steps that he and the patient are to take and exactly how to implement each step in the detoxification program first described in the companion textbook.

**A specific description of this Scientific Review:** The technique used here is intended to dovetail with the doctor's own preferred protocol, which may differ from doctor to doctor. It assist the doctor by providing a checklist of all necessary steps in the treatment plan. It helps the doctor in assessing their patient's risk of exposure to mercury from dental amalgam fillings, and does so in a manner that has been approved by the IAOMT. The handbook then presents the detox program itself in a stepped sequence, followed by important considerations for amalgam replacement. Finally, the book informs the doctor of the rationale for the importance of IV-C during or after amalgam replacement, and it outlines the steps to be taken in administering IV-C (if this is his/her choice). To expedite the treatment plan a number of forms are available for their patients to complete and sign. They can be found at the conclusion of the booklet.

**Manufacturer(s):** Publisher: Queen & Company Health Communications, Inc.; P.O. Box 49308; Colorado Springs, Co. 80949-9308; H.L. "Sam" Queen and Betty A. Queen, co-authors.

**Scientific Literature:** The doctor's handbook cites its companion book, Chronic Mercury Toxicity: New Hope Against an Endemic Disease, which contains over 500 references, as well as information compiled over the past two years in two newsletters, Mercury Free News and Health Talk. The protocol in the Doctor's guide also reflects important research that has surfaced during the 30 months since its companion book was published in 1988.

**Legal Aspects:** To cover the doctor's liability in the treatment of any patient with chronic mercury toxicity, the handbook provides a wide array of forms, including informed consent forms, for the purpose of establishing the best socially accepted/ADA accepted relationship between doctor and patient. It also advises the patient that the doctor cannot make health promises regarding this treatment program. In this manner patient expectations are kept on a realistic plane. Some people, after all, may not improve on this program—a fact that needs to be made clear to the patient.
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<th><strong>Applicant Name:</strong></th>
<th>Homer L. &quot;Sam&quot; Queen, DSc</th>
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The IV-C Mercury Tox Program: A Guide for the Patient

| Received | 3/15/91 |
| Scientific Review | 3/25/91 |
| IAOMT Board Review | 5/18/91 |
| Reevaluation | 9/01/00 |

### Scientific Review

**Biological Support**

| Approval | Provisional Approval |
| No Opinion | 5/20/91 |
| No Approval |

**Explanation of IAOMT position:** Must reading for information on Vitamin C but be aware that IV administration of Vitamin C is outside the dental standard of care and best be done by physician.

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**Name of Scientific Review:** The IV-C Mercury Tox Program: A Guide for the Patient

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**This Scientific Review is a Publication**

**Purpose of the Scientific Review:** Additional information for the patient

**Scientific Review History:** This Handbook was compiled as the result of suggestions from doctors who agreed with the concept of a companion book, but who had difficulty bridging the gap between concept and practice. It is also the result of suggestions from researchers who need a "cookbook" style manual in order to study the program as a whole. Doctors and researchers alike wanted a book that they could simply hand to their patients and say to them, "follow this program in its every detail, making changes only when and where I specify."

**A brief description of the Scientific Review:** The companion handbook spells out (for the doctor in cookbook-like style) the steps that he and the patient are to take and exactly how to implement each step in the detoxification program first described in the companion textbook.

**A specific description of this Scientific Review:** The technique used here is intended to dovetail with the doctor's own preferred protocol, which may differ from doctor to doctor. It assist the doctor by answering many of the questions that patients commonly have regarding the treatment plan they are about to participate in. It helps satisfy the patient's curiosity regarding how the doctor will assess their risk of exposure from mercury dental amalgam fillings, and explains that the technique for doing this has been approved by the IAOMT. The handbook then presents the detox program itself in stepped sequence, followed by important considerations for amalgam replacement. Finally, the book informs the patient of the rationale for the importance of IV-C during or after amalgam replacement. To expedite the treatment plan a number of forms are available for them to complete and sign. They can be found at the conclusion of the booklet.

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Low Dose Cytokines
&
Mercury Amalgams Fillings

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Explanation of IAOMT position: Although this SR may be considered outside the current “standard of care” in the U.S., it does not detract from its merits and deserves serious consideration for use as long as one takes into the legal ramifications of its use and potential risks/benefits for one’s patients. See: Legal Aspects of SR. Well done SR!

Name of Scientific Review: Low Dose Cytokines & Mercury Amalgam Fillings

Alternative name(s) of Scientific Review: The use of Low Dose Cytokines to counteract the signaling effects of Mercury Amalgam Fillings

This Scientific Review is related to: Dentistry and Medicine

This Scientific Review is a: Procedure

Do you have a vested financial interest in this Scientific Review? No

Purpose of the Scientific Review: To provide information to aid the dentist in the use of a modern biotherapeutic approach to preparing their patients for mercury removal

Scientific Review History: Research in the fields of Psychoneuroendocrineimmunology (PNEI), Toxicology and Immunology has identified the cytokines/interleukins as the messenger molecules of the body. The use of cytokines has been heavily researched and investigated by the Pharmacy industry with mixed success. Interferon has been used in the treatment of MS patients. While there has been mixed success, their usage has always been accompanied by rather severe side effects. Recent scientific research from the scientific department of the Italian firm GUNA, Inc. has shown how cytokines at the physiological concentration, rather than the pharmacological concentration, can be used to help the body self regulate the natural homeostatic balance within the complete PNEI system as mercury disturbs the delicate balance of the concentrations of these molecules in the body. The use of the principles of physiological regulating medicine can now provide the dentist with simple but effective tools to deal with the effects of Hg toxicity without any side effects.

Briefly describe the Scientific Review: The IAOMT has long championed the cause and effects of mercury toxicity and now more recent scientific research is starting to prove the mechanisms through which the mercury has the toxic effects on the body. Simultaneously the latest scientific research on the use of low dose pharmacology is providing the dental practitioner with a
bigger and more effective tool box to deal with the effects of mercury toxicity. The use of low dose cytokines have been scientifically proven to be effective without any side effects associated with pharmacological intervention and provide an excellent support program to the patient undergoing mercury removal.

A specifically, by outline if appropriate, describe the Scientific Review: The signaling aspect of mercury released from amalgam fillings causes a signaling cascade of inflammatory mediators resulting in an imbalance to the PNEI axis, causing a loss of Homeostatic balance in the patient. To aid the dentist in supporting his patient during a course of mercury removal the use of low dose cytokines is to be advocated. This is to be done in conjunction with the normal nutritional support to aid the redox balance during the mercury removal (the appropriate levels of vitamins, minerals, glutathione, whey proteins must be provided).

The use of these low dose cytokines has been scientifically proven to be as effective as the use of NSAIDs and Corticosteroids but without the side effects of either. Providing a cocktail of GUNA Flam, GUNA Cell and GUNA Matrix in a liter of water protects the body against any side effects that the patient may experience during mercury removal. 40 Drops of each remedy should be placed in a liter bottle of water and the patient should drink this throughout the day. This ensures that the patient receives the stimulation of the remedies to help rebalance the HPA axis and turn off the detrimental signals. It also helps to ensure that the patient is adequately hydrated during the mercury removal process. For further details please refer to Appendix A.

Manufacturer(s), Distributor(s), or Publisher: Guna, Inc., 3724 Crescent Court West, Whitehall, PA., 18052, USA

Scientific Literature:


5. Effects of Gold on cytokine production in vitro. Lampa et al 2002 J Rheumatol Jan;29(1);21-8

6. Effects of different doses of IL1B on isolated Human fibroblasts: University of Milan


For further scientific literature please see Appendix A & B at the end of this document
Legal Aspects of this Scientific Review: Each practitioner would need to qualify in the use of physiological regulating medicine to use the advised protocol. The academy of Physiological Regulating Medicine provides a fully certified learning course at www.prmacademy.com. Each practitioner should also ensure that this is regulated within their own state/province jurisdiction. The intention of this scientific review is to inform the dental surgeon about the latest advances in the use of cytokines and their relevance in dentistry.

<table>
<thead>
<tr>
<th>Applicant Name: David Hefferon, BDS, Dip HomTox, FIAOMT</th>
<th>Office Phone: 61 299-535-153</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mailing Address: 40 Yeo Street</td>
<td>Office FAX:</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>IAOMT Member #: 967</td>
<td>e-mail: <a href="mailto:davidhefferon@aol.com">davidhefferon@aol.com</a></td>
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<tr>
<td>IAOMT Chapter: North American</td>
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Appendix A: The use of low dose cytokines to counteract the signaling effects of Hg from amalgam fillings

Professor Paranandi of the University of Ohio has presented his most recent research to the IAOMT on several occasions. The research of Professor Paranandi demonstrates that mercury toxicity is linked to the aetiology of cardiovascular disease. The mechanism through which this happens occurs at the endothelial lining resulting from damage done to the phospholipid cell membrane.

It is through the activation of the Phospholipase A2 and Phospholipase D enzymes amongst others that the Arachidonic acid pathway is activated through the stimulation of the Cox 2 and Lox enzymes. It is the signaling aspect of the activation of these molecules that is so important and is responsible for the damage to the cell membranes affected. This causes a whole cascade of events affecting the complete Psycho Neuro Endocrine Immunology (PNEI) axis and thus causes Hg to have a widespread effect on the whole body. Traditional pharmacology uses NSAIDs and Corticosteroids to help deal with the effects caused by the Hg toxicity in the body. These however, are not without well documented side effects and so sometimes the cure can be worse than the disease.

The scientific principle of Hormesis states that the action of a particular molecule either exogenous or endogenous will have a different effect on the body depending on the dosage that the individual is exposed to. High doses can inhibit a particular response in an animal while low doses of the same material may stimulate a desired response. TNF alpha is a normal first stage inflammatory messenger molecule which is necessary for the survival of a cell. However, in high concentrations the same molecule will cause cytotoxicity and harm the cell. Research from the scientific department of GUNA in association with the University of Milan has demonstrated that the correct physiological dose of any material in the body lies in the concentration range between 10 to the minus 7 and 10 to the minus 12, or the range of nanogrammes per ml to picogrammes per ml. Higher doses than this in the range of microgrammes per ml will have a pharmacological effect but will produce side effects. Higher again concentrations of milligrammes per ml will cause toxic effects in the body.

As a result of the activation of the Phospholipase enzymes due to the presence of Hg at the cell membrane the Cox 2 pathways get activated and an excess of Interleukin 1 (IL1) is produced. The interleukins IL1 alpha and IL1 beta are the most active primary mediators secreted by TH1 cells to induce inflammation in the body. They do this by activating the COX2, Prostaglandin E2 and nitric oxide pathways and so cause inflammation. Anti interleukin 1 at a physiological dose can act as a NSAID, corticosteroid or salicylate without any side effects associated with these allopathic medicines. Therefore if we can use anti interleukin 1 in a safe and effective manner we can help reduce
the inflammatory processes in our patients with Hg toxicity, such as patients presenting with osteo-arthro-myalgic pain. Anti IL1 is found in GUNA Flam. Due to the particular presence of certain cytokines at a physiological dose GUNA Flam helps up regulate TH2 lymphocytes to help balance the excessive expression of TH1 inflammatory cytokines.

As Hg will also attack the membranes of the mitochondria GUNA Cell has been added to cocktail. GUNA cell provides the patient with all the constituents of the Krebs cycle at a physiological dose to help maintain and restore normal mitochondrial activity. It also contains alpha lipoic acid, Fumaric acid, as well as the coenzymes necessary to aid in the removal of toxins from the intracellular space. The Michaelis Menten Law which states that in a reaction catalyzed by an enzyme, the reaction velocity is inversely proportional to the concentration of the enzymatic substrate. Therefore a low dosage, the physiological dosage, of the enzymatic substrates is in GUNA Cell.

The cell membrane is a morphofunctional unit and is surrounded by the extra cellular matrix. The cytokines, neuropeptides, vitamins and nutrients etc must all travel from the blood capillaries to the cell membrane through the extra cellular membrane. It is in the extra cellular matrix where we find the Reticular endothelial system. Here we find collagen and elastin fibres, nerve endings of the autonomic nervous system, adipose cells, mast cells and macrophages etc. The extra cellular matrix is a peculiar connective tissue consisting of water, proteins, mucopolysaccharides and glycosaminoglycans. A properly functioning fluid matrix is essential for proper function and Hg can destroy or clog up different parts of the extracellular matrix before affecting the cell membrane. To keep the matrix fluid and to help protect the messenger molecules that must move through this matrix we add GUNA Matrix to the cocktail.

The GUNA Matrix provides the body with the ability to mobilize the toxic load from the cells into the lymphatic system. It also helps stimulate IL6 which is known to be able to activate metalloproteinases. These enzymes help liquefy the matrix allowing the toxins blocking the matrix to flow out of the matrix.

The combination of GUNA Cell, GUNA Flam and GUNA Matrix in adequate water provides a safe and effective method, without any side effects due to the physiological concentration of the dosage, to help relieve inflammation and turn off the signaling component of the Hg released from the amalgam fillings making the removal process of the amalgam fillings a more pleasant experience for the patient.

Appendix B: the use of low dose cytokines to counteract the signaling effects of Hg from amalgam fillings.

4. Biochemistry and Molecular Biology (W H Elliott & D C Elliott; Oxford University Press; 2nd ed 2001)
5. Biochemistry: the chemical reactions of living cells (Metzler D E; Academic Press; 2nd ed, vol 1, 2001)
# N-Acetyl-L-Cysteine (NAC)

## Role in Mercury Exposure Protection and/or Detoxification

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<th>3/4/00</th>
<th>IAOMT Board Review</th>
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<th>Reevaluation &amp; Revision</th>
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### Explanation of IAOMT position:
NAC looks promising to help with mercury protection and detoxification. There are not enough studies proving efficacy or safety. This supplement should be re-evaluated as more scientific studies are completed.

### Name of Scientific Review:
N-Acetyl-L-Cysteine – Role in Mercury Amalgam Removal Protection and/or Detoxification

### Alternative name(s) of Scientific Review:
NAC = N-Acetyl Cysteine

### What is this Scientific Review related to?
Medicine & Dentistry

### Is this Scientific Review a Product?
No

### Purpose of the Scientific Review:
To evaluate the effectiveness of N-Acetyl Cysteine in mercury protection and detoxification

### Do you have a vested financial interest in any part of this Scientific Review?
No

### Scientific Review History:
None

### Briefly describe the Scientific Review:
Oral use of NAC to increase glutathione levels to help with mercury protection and detoxification

NAC is a premier antioxidant, antitoxin, and immune support substance. NAC is a nontoxic derivative of dietary amino acid L-cysteine, and is a dietary precursor to reduced glutathione (GSH). GSH, Sistene, and NAC are all sulphydryl (-SH) substances. All provide the body with antioxidant properties, important to homeostasis and to normal metabolism overall. Favorable sulphydryl balance is important for aiding neutralization of toxins, such as heavy metals (mercury, cadmium, and lead). NAC supports the body’s sophisticated system of enzymes, the “P-450 system,” that is mainly responsible for detoxifying a plethora of chemicals called xenobiotics.

### Specifically, by outline if appropriate, describe the Scientific Review:
Suggested use: oral supplementation of 600-1800 mg per day

### Manufacturer(s), distributors, or publisher:
- Allergy Research Group (800-545-9960)
- Twin Labs (800-645-5626)

### Scientific Literature:
included with application – consult with applicant

### Legal Aspects of this Scientific Review:
Use by a dentist must be as a protective function from the potential toxic effects of mercury from amalgam fillings, not as in a medical detoxification role.
<table>
<thead>
<tr>
<th><strong>Applicant Name:</strong> Robert W. Kulp, Jr., DDS, AIAOMT</th>
<th><strong>Office Phone:</strong> Retired</th>
</tr>
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<tbody>
<tr>
<td><strong>Mailing Address:</strong> 535 Riverbend Drive</td>
<td><strong>Office FAX:</strong></td>
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<tr>
<td><strong>IAOMT Member #: 454</strong></td>
<td><strong>e-mail:</strong> <a href="mailto:rkulpjr@triad.rr.com">rkulpjr@triad.rr.com</a></td>
</tr>
<tr>
<td></td>
<td><strong>IAOMT Chapter:</strong> North America</td>
</tr>
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**Oral Detox Pro Oral Rinse**

| Received | 9.11.09 | Scientific Review | 12.28.09 | IAOMT Board Review | 9.22.10 | Reevaluation & Revision | .....
|----------|--------|-------------------|----------|---------------------|--------|------------------------|------

**Explanations of IAOMT position:** Useful for those who still have mercury fillings in their mouth & product is suggested to “hopefully” only to decrease mercury vapor before and after removal. Recommendations are based solely on one article published in Townsend not peer reviewed. This product needs science but has promise and explores new issues.

**Name of Scientific Review:** Oral Detox PRO Oral Rinse

**Alternative name(s) of Scientific Review:** Oral Mercury Vapor reduction

**This Scientific Review is related to:** Medicine & Dentistry

**This Scientific Review is a:** Product

**Do you have a financial interest in any part of this SR?** No

**Purpose of the Scientific Review:** Oral rinse to reduce mercury vapor during amalgam removal

**Scientific Review History:** A new product has been developed based on a previous product called NDF Formula by BioRay, Inc. This article, “The Mitigation of Mercury Vapor Inhalation and exhalation in people with Dental Amalgam Fillings” 2002 Timothy Ray, DMD lac Published in Townsend Letter for Doctors and patients, Nov 2002, #232, is the precursor of the SR and is essentially the same substance.

**A brief description of the Scientific Review:** An oral rinse, pre and post amalgam removal with the product.

**A specific description of this Scientific Review:**

Oral Detox Pro is a chlorella based oral rinse that has been shown to be effective in drastically reducing mercury vapor detectable in a mouth with amalgam fillings present. The supportive literature only documents the reduction of measurable intraoral mercury vapor. There is NO evidence, and no claims, about reducing absorption through the intraoral mucosa. This has not been studied, to the best of my knowledge. So based only on it’s demonstrated effectiveness at reducing intraoral mercury vapor, its recommended use in a mercury safe protective protocols is to rinse before the beginning of treatment (rinse for 30 seconds, suction the excess, don’t rinse with water afterward), reducing intraoral mercury vapor in the presence of mercury amalgams. Hopefully, residual product in the mouth during treatment may be protective. Then, rinse as above, immediately after amalgam removal to provide one more means of cleaning up the mouth post treatment.

**Manufacturer(s):** BioRay, Inc

**Scientific Literature:** Contact author as document is lengthy

**Legal Aspects of this Scientific Review:** None

**Applicant Name:** Paul Rubin, DDS, MIAOMT

**Office Phone:** 206-367-4712
Appendix A: This attached document was scanned in and as such, is lacking in form and some context. To really understand the content of this SR, this document is needed but was not incorporated directly into the SR by the author. Please contact the author for the actual document.

The Mitigation of Mercury Vapor Inhalation and Exhalation in People with Dental Amalgam Fillings
©2002 Timothy Ray OMD LAc Published in Townsend Letter for Doctors and Patients, November 2002, #232

Source of Inspiration for this Study A metal toxic patient, female, age 42, who had been doing extremely well on a detoxification program, called to report a sudden and inexplicable aggravation of her previous symptoms. The only difference we could determine was that her mother had moved in with her the day before the aggravation began. She got along fine with her mother. It finally surfaced that the mother had a mouthful of amalgams fillings and that the symptoms became distinctly worse while the mother was in the room with her. I instructed her to ask her mother to simply 'brush, rinse and spit' with a few drops of NDF 3 times a day. The daughters' symptoms went away very quickly. Also, the mothers' health took a distinct turn for the better.

This event raised several questions. We all know that people with amalgams are becoming more toxic with each breath they take, and nothing has yet been discovered to protect them while the amalgams are still in the teeth. For every breath they inhale, they also exhale (and or 'outgas') into the workplace and the environment in which they live, posing a lesser yet significant threat to those around them. This group, with amalgam fillings still present in the teeth, represents a huge patient population.

Abstract Is it possible to minimize the damage caused by the inhalation of mercury vapor leaking from amalgam fillings (precipitated by chewing, drinking hot beverages, teeth grinding, dental procedures, substandard 'soft' alloy preparations, galvanism) during pregnancy, while patients are waiting to get their amalgams replaced, during the procedure of having them replaced, or during heavy metal and chemical detoxification? DMPS, DMSA, and Metal-Free/peA are known to cause side effects if used while amalgams are still in the teeth and are therefore contraindicated for these patients. NDF, used as directed, has never been known to cause a side effect in any patient. We know that NDF causes the excretion of heavy metals predominantly via the urine from independent lab data, but can it directly bind to mercury vapor in the oral cavity? If it did, we would also have more insight into what it is doing after it gets into the body.

The following study was conducted using the Genesis Labs AAS (atomic absorption
An attempt was made to determine if the mercury vapor precipitated by chewing could be bound and then discarded (identified as a decrease in mercury levels after brushing and spitting) without causing an increase in the oral presence of mercury (identified as an increase in the mercury level after brushing and spitting).

It was found that NDFTM in the amount of 10 drops repeatedly and effectively bound 100% (dose related) of the mercury vapor precipitated by chewing, and did not cause the precipitation of additional mercury from amalgam fillings into the oral cavity, as measured by atomic absorption spectroscopy.

Pre Test Safety Check A 6 mm² piece of amalgam alloy containing mercury, silver, copper and zinc was submerged and agitated in 1 ml of NDFTM, sealed, and left to sit for one hour. The following pre and post measurements were observed: There was no change in conductivity (mS/cm), mercury content (Dithizone reagent), or emanation of mercury vapor immediately upon opening of the test container (0.001 mg/m³). This reassured us that conducting the test would not cause further toxification of the participants.

Preliminary Substance Tests and Control The oral cavities of all persons in the study were measured with the Hg253 at rest, after chewing gum, and after brushing and rinsing with various substances. Peak values are reported in milligrams per meter cubed (mg/m³). Measurements were taken through a tube placed in the center of the oral cavity while the lips were closed and the person breathed through the nose. The number and age of amalgams, and the presence or absence of gold fillings were recorded as a reference.

NDFTM (a 10 drop dose containing 10 mgs. nanonized chlorella) was compared to 10 mg of normal 'cell wall broken' chlorella and then again to 100 and 500 mg of normal chlorella, all mixed with water. MouthMagic TM and Vitamin C were compared because MouthMagic TM contains 300 mg vitamin C per ounce, and we wanted to see what part the vitamin C might be playing in the effect. We used reverse osmosis water for the control, also curious to see if it had any metal binding effect of its own. DMPS, DMSA and Metal-Free/peA were not tested as they are contraindicated while amalgams are present in the teeth. EDTA was not tested because it is not known to primarily bind to mercury.

### Substances

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<th>Pos</th>
<th>Post</th>
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Normal chlorella finally performed equally to NDFTM, but at a 500 mg dose, which required brushing and rinsing with the entire quantity, and then rinsing again with riO water. This was extremely messy and distasteful to the patient as compared to a mere 10 drops of NDFTM. Interesting to note that it took 50 times more normal chlorella to bind as much mercury vapor as NDFTM, which highlights the effectiveness of the 'nanonization' process. This explains why most of the testing done with normal chlorella has shown it to be 'lacking' as a heavy metal chelator.

Study Group. Following the selection of the most convenient and efficient method based on the above study, the following study was conducted with 19 people. 5 showed no detectable elevation of mercury after chewing (possibly harder, older fillings as all of these people had had them in for between 20 50 years). 2 did not have time to brush, rinse and re-test. The remaining 12 are reported below. The oral cavities of all persons in the study group were measured with the Hg253 at rest, after chewing, and after brushing and rinsing with either 5 or 10 drops of NDFTM.

| Code | Age | #/ age of amalgams in years | GDld | fillings | Resting | Resting SpH | mgfm | Post | PO:;t ch~wing | wash ma/m~ | ma/mi | % SR | 6/22 N Dose: 6.3 6.5 7.4 7.1 6.4 6.4 7.3 6.0 10 drops NDF <.001 .002 .083 <.001 <.001 <.001 <.001 .002 .005 .002 100% .131 100% .016 <.001 100% .019 <.001 100% .023 <.001 100% .019 <.001 100% .004 <.001 100% .131 100% .073 100% .51 .17 66%** .016 .002 81%** .084 .046 100% KR | DD | 5/0 32 64 47 | 6/37 N 10/16 N 6/30 2 | N N N 1 | N N N N | GL JT LW 28 AS 38 11130 | LM 42 DO 32 | 2/30 10/16 | Dose: 5 droDS NDF .097 <.001 <.001 .054 LB 32 DO 32 10/16 | 5/10 5/32 | 1/12 vfn | • brushed for 30 seconds, also notice the massive release of mercury in this person with newer fillings. ** brushed for 3 minutes

Background: Safe Limits of Exposure The American Conference of Governmental Industrial Hygienists (ACGIH) has established a threshold level value of 0.025 mg/m3 of mercury for an eight hour time period. The ACGIH additionally recommends...
that women of childbearing age should not be exposed to air concentrations of mercury greater than 0.010 mg/m³. Additional regulatory agency guidelines for mercury exposure levels are as follows. The Mine Safety and Health Administration (MSHA), National Institute for Occupational Safety and Health (NIOSH), and the World Health Organization (WHO) have established an exposure limit of 0.050 mg/m³ for an eight-hour time period. The Occupational Safety and Health Administration (OSHA) has established a ceiling (peak) exposure level of 0.100 mg/m³.

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- Conversion f ppm to ppb
  - 1 ppm = 1 mg/L = 1 g/ml = 1000 ppb. To convert from milligrams to micrograms = x1000 or move 3 decimal places to the right. To convert from micrograms to milligrams = 1/1000 or move 3 decimal places to the left.

**Background: Measurements, Conversions, Nomenclature**

One ppm (part per million) of mercury (molecular weight 200.59) at 7SoF, at 29.9 in. of Hg (sea level) equals 8.22 mg/m³ or 8220 μg/m³ of mercury. One ppb (part per billion) Hg is equal to 0.0082 mg/m³. One ppm = 1 mg/L = 1 g/ml = 1000 ppb. To convert from milligrams to micrograms = x1000 or move 3 decimal places to the right. To convert from micrograms to milligrams = 1/1000 or move 3 decimal places to the left.

**Background: Dental Amalgams Hazard**

Amalgams contain 50% mercury, 35% silver, 9% tin, 6% copper and a trace of zinc. A single dental amalgam filling with a surface area of only 0.4 sq. cm is estimated to release as much as 15 micrograms of mercury per day primarily through mechanical wear and evaporation. In direct contradiction to the published literature, an ADA spokesman estimated that only 0.08 micrograms of mercury per amalgam filling are taken in per day. The average individual has eight amalgam fillings and could absorb up to 120 micrograms (0.120 mg/m³) of mercury per day from their amalgams.

**The primary route of mercury absorption into the body is through the inhalation of mercury vapor.** The mercury vapor from the amalgams is lipid soluble and passes readily through cell membranes and across the blood-brain barrier. The human body retains approximately 75% of the mercury that is inhaled. Animal studies show that radioactively labeled mercury released from ideally placed amalgam fillings appears quickly in the kidneys, brain, and wall of the intestines. The mercury escapes continuously during the entire life of the filling primarily in the form of vapor, but also abraded particles. Chewing, brushing, and the intake of hot fluids stimulate this release. Gold placed in the vicinity of an amalgam restoration produces a 10-fold increase in the release of mercury. The current ADA estimate that only 0.08 micrograms of mercury per amalgam per day is taken into the human body does not take into consideration that up to five-sixths of the mercury released would be into the tooth (that area of the amalgam that exists below the visibly exposed amalgam surface) and not into
the oral air. In addition, some mercury in the oral air would be rapidly absorbed into the saliva and oral mucosa (mercury loves hydrophobic cell membranes) and also not be measured by the mercury analyzer. The ADA estimate does not include the increase that would occur with amalgams in the mouth when chewing, grinding the teeth, drinking hot liquids or in the presence of galvanism, which all greatly increase the release of mercury. Further, as the mercury analyzer pulls mercury containing oral air into the analysis chamber, mercury free ambient air rushes into the oral cavity decreasing the mercury concentration. Taking all of this into account you can calculate that most mercury analyzers could not detect this "estimated" 0.08 micrograms/day level of mercury even if you had several amalgams. However, the fact is that it is quite easy to detect mercury emitting from one amalgam using these (mercury vapor) analyzers. Therefore, the "estimate" by this ADA spokesman is way too low.

According to this study, a person with amalgams mobilizes (inhales or exhales) between 1 - 50 ppb mercury vapor per (mouth) breath or swallow per mouthful of chewed food per meal per day, most of which is swallowed. According to the ACGIH peak limit of exposure for women of childbearing age of 1.21 ppb mercury, eating anything more than one half of one mouthful of food at a time, or more than 2 mouthfuls in an eight hour period, would be out of the question and recognized as unsafe according to the lowest levels detected during this study. That's not enough food per day, especially for a pregnant woman, nor does the situation offer an acceptable option: starve or be poisoned.

Mid-Data Reality Check

Mercury is neurotoxic to some degree at any level, and has pernicious synergistic effects in combination with many forms of bacteria, other metals, and chemicals. Though we can measure exposure and excretion levels, we cannot yet measure cumulative body burden levels. Levels way below what is considered as 'safe' devastate some patients, especially allergic ones. Others, reminiscent of the 90 year old who subsists on Big Macs, seem to at least temporarily tolerate higher levels. The bottom line for this author is that if the patient has a 'complaint' or imbalance in conjunction with heavy metal exposure, addressing the toxicity issues first leads to greater and longer lasting clinical improvements than merely addressing the symptom.

Tobacco Smoking: Of Interest It is known that the tobacco plant efficiently concentrates mercury out of the soil, so while preparing to use the Hg253 unit, we measured the smoke coming off of an additive free tobacco cigarette (0.014 mg/m$^3$ of Hg) versus the exhaled smoke of the same cigarette (0.004 mg/m$^3$ of Hg). The smoker effectively filters out the 'danger level' of mercury in tobacco smoke into their own body, therefore it is the uninhaled secondary smoke that is of most danger to others in the vicinity. For the smoker, that's roughly 1 ppb mercury per puff.

Age of Amalgams vs Out Gassing Observation It was interesting to note that many of the people tested with uncracked amalgams over 25 years old were no longer out gassing after chewing.
Some Applications of the Data NDFTM can be used to safely and effectively rid the oral cavity of precipitated mercury vapor after chewing, eating, brushing or otherwise disturbing teeth containing amalgam fillings. The dose required during brushing can be estimated from the above data according to number and age of amalgams, relative hardness of amalgams, normal length of chewing, and duration of brushing. In general, the less they use (5 drops), the longer they have to brush, rinse and spit (3-4 minutes). The more they use (10 drops), the shorter the cleaning time (30 seconds to 1 minute).

The necessity of dealing with amalgam fillings in a timely manner can easily be demonstrated by repeating the above experiment, as can the effectiveness of treatment with NDFTM. If the cost of a mercury vapor analyzer is prohibitive ($15~25K for a new pro model), the unit can be rented for short periods, and ‘measurement’ appointments scheduled and delegated.

During detoxification, while amalgams are still in the teeth, the patient brushes with 10 drops NDFTM, spits and then rinses with rlo water before taking the dose of NDFTM as drops down the back of the throat, followed by a glass of pure water.

Because up to 5/6 of the surface of an amalgam can be inside the tooth, and thus not out gassing into the oral cavity, this cleansing procedure is therefore not a complete alternative to having amalgam fillings replaced. It does however minimize and mitigate the inhalation and exhalation exposure.

Conclusions
We managed to prove that we could get mercury vapor to go down the sink instead of down the throat, which is a definite improvement, but I have yet to hear about a plan for dealing with it after it goes down the sink or toilet and into the environment. Who pays the bill for that?

The various organizations, companies and people who deceived us into thinking it was safe to put mercury into our teeth?

1 Please goto www.hvdeIQXPl and click on Lab Results on the SiteMap. 2 Genesis Laboratory Systems, Inc. 1005 North 12th street Grand Junction, CO 81501 (970) 241-0889 (888) 210-0465 fax. (910) 241-1239 www.genlabsystems.com hlv=<!llyiW;enl<!h-n=IIIli.l2mJ see Conversion Calculator at www.hvdiNi*lvgiene.com?Il. and conversion formulas at "www.--r(!,h---
4 Toxicological Profile for Mercury. U.S. Department Of Health & Human Services, Agency for Toxic Substances and Disease Registry, March 1999111lished by Division ofToxicology, 1600 Clifton Road NE, E-29, Atlanta, Georgia 3033
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Svare CW, Peterson Le, Reinhardt JW, Boyer DB, et a1; The effects of dental amalgams on mercury levels in expired air. J Dent Res 1981; 60:1668-1671


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BioRay, Inc. 23151 Alcalde Drive, Suite C-3 Laguna Hills, CA 92653 (949) 305-7454 www.bloravn!lml!lID!lQ..~c;~m
**Oral Megadose Ascorbate (Vitamin C)**

<table>
<thead>
<tr>
<th>Received</th>
<th>1/27/91</th>
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<tbody>
<tr>
<td>Scientific Review</td>
<td>2/1/91</td>
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<tr>
<td>IAOMT Board Review</td>
<td>1/18/92</td>
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<tr>
<td>Reevaluation</td>
<td>9/01/00</td>
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<tr>
<td><strong>Scientific Review</strong></td>
<td>1/20/92</td>
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<tr>
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<td>Provisional Approval</td>
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**Explanation of IAOMT position:**

- **Name of Scientific Review:** Oral Megadose Ascorbate (Vitamin C)
- **Alternative name(s) of Scientific Review:** Ascorbic Acid, Sodium Ascorbate
- **This Scientific Review is related to Medicine & Dentistry**
- **This Scientific Review is a Product & Procedure**

**Purpose of the Scientific Review:** To instruct the proper use and concerns in the oral use of Vitamin C

**Scientific Review History:** Megadose oral vitamin C was commonly given in the 1940's and 1950's to protect against overdose of mercurial diuretics, which were routinely employed then (and occasionally today) as a treatment for high blood pressure. The mechanism of action has been explained partly to the ascorbate anion's ability to form a partnership with ionic mercury (being excreted in the urine as mercury ascorbate), and partly by the ability of ascorbate to reduce Hg\(^{2+}\) to Hg\(^{+}\), which is much less likely to attach to and interfere with biologically essential SH groups. In support of this theory, it has been reported that in patients who had clearly overdosed on mercurial diuretics, megadose Vitamin C caused their symptoms to entirely disappear.

**A brief description of the Scientific Review:** To protect against the effect of mercury during the routine removal of dental amalgam a patient should be instructed to consume foods high in vitamin C and to supplement with 3 grams of vitamin C daily, beginning a week or so before amalgam replacement and continuing for at least a month afterwards.

**A specific description of this Scientific Review:**
- Instruct the patient to take their vitamin C in 500 mg to 1 gram increments throughout the day.
- This allows the free radical scavenging activity of vitamin C to be available at the moment the free radicals appear. Ascorbic acid, sodium ascorbate, and naturally-occurring vitamin C are the preferred sources of vitamin C.
- To minimize the potential for kidney stones, total calcium intake should be maintained within a narrow range (800-1,000mg daily), magnesium intake should be increased to 500 mg per day, and vitamin B6 intake should be increased to 30 mg per day. This amount of calcium and magnesium is ideally obtained from 3 servings of cultured dairy foods per day, but to obtain the desired dosage of vitamin B6, a supplement will be required. In addition, since megadose Vitamin C may enhance the excretion of zinc, a 15 mg supplement of chelated zinc per day is recommended.
- In those people with serious health problems, a consultation with a physician is necessary and they may wish to consider that one increase their vitamin C supplements to 5 to 10 grams of vitamin C daily and chelated zinc to 25 mg. (again, beginning a week or so before and continuing indefinitely according to their individual health status)
- When the time comes for the patient to reduce their intake of vitamin C instruct them to taper off slowly-like one gram per week, and if they insist on going off vitamin C all together instruct them to maintain a minimum of 250 mg per day for three weeks before quitting. This guards against the risk of rebound scurvy.

**Manufacturer(s)/Source:** (care should be taken in selecting products)
- Bronson Pharmaceuticals; 4526 Rinetti Lane; La Canada, CA 91012-0628; Telephone (800) 521-3322
- Klaire Laboratories; 1573 W. Seminole St.; San Marcos, CA 92069; Telephone (619) 744-9680; FAX (619) 744-9364.5

**Scientific Literature:** I refer you to Appendix A of this report and to the book, "Chronic Mercury Toxicity: New Hope Against an Endemic Disease", by H.L. "Sam" Queen
**Legal Aspects of this Scientific Review:** Vitamin C has been used safely and effectively as adjunct therapy in a wide array of dental related diseases. Yet, there remains the extremely rare individual who may be harmed by megadose vitamin C. Predictably, the high risk patient will have impaired kidney function or a deficiency of enzyme, G-6-PD (which causes chronic anemia, red cell fragility, and a slightly jaundiced appearance). It is essential to inquire from all patients as to whether or not the patient has had a history of either of these conditions. If the patient response is affirmative, referral to a physician is essential. Vitamin C should not be prescribed for any patient who has a history of kidney stones!6

**References:**

2. As a vitamin, only 65 mg of vitamin C per day is required to prevent the symptoms of scurvy. Beyond this essential function, however, ascorbate (formed naturally from ascorbic acid) is the body's premier free radical scavenger. Carrying out this antioxidant function calls for significantly higher dosage of ascorbate than what is required to satisfy its vitamin role, and an even higher dosage is required following chronic exposure to mercury-an important catalyst of free radical oxidation. (Cathcart, R.F., "A Unique Function for Ascorbate," Medical Hypothesis, 35:32-7, 1991).
3. If you prefer to evaluate your patient's vitamin C status beforehand, you can easily do this by the "lingual ascorbic acid test" method. (Test kits are available through Dental Diagnostic Services, Inc., P.O. Box 1441; Brandon, FL 333509; Tele 813/681-3935.)
4. Do not prescribe calcium ascorbate (Ester C, for instance),for two reasons:1)Vitamin C as calcium ascorbate remains in the blood for a much longer period than any other source of vitamin C, which is believed by Cathcart (Medical Hypothesis 35:32-7, 1991) to indicate that the itamin C from this source is unavailable as a free radical scavenger. 2) One gram of vitamin C as calcium ascorbate provides 124 mg free calcium. When one considers the findings of Galin and Ostbaum (Annals of Ophthamology, 1257-61, Dec 1974) that free calcium in the presence of mercury is capable of denaturing ocular protein and proteins of other cells as well, then it is best to avoid giving this and other calcium supplements to mercury toxic people.
5. If the patient is hypersensitive to vitamin C, which is indeed rare, you might suggest a natural vitamin C from citrus or sago palm (available in most any health food store.)
6. The legal aspect can be carried to extreme, but to dispel the fear of kidney stones among normal, low risk patients, leading authorities recommend that, in addition to the instructions in reference 5, they consume 8 or more glasses per day (Robertson, W.G., et al., Urinary Calculus, in Prockin, PSG Publishing Company, p.3-12,1981); add a tablespoon of lemon juice daily to the water - an excellent source of protective, potassium citrate (Meyer and Thomas, J. Urol, 128:1376-8, Dec 1982); eat a daily tablespoon of pumpkin seeds - an excellent source of protective pyrophosphate (Suphakam, et al., AJCN 45, 115- 21, 1987); and encourage them to urinate as often (and as soon) as they have the urge, which discourages aggregation of stone-forming particles (Tschope, et al., Proc EDTA, 20:407-9, 1983).

**APPENDIX A**

Literature citations and clinical use of megadose oral vitamin c in protecting patients from the effects of mercury and in the treatment of chronic mercury toxicity submitted for IAOMT Treatment Protocol consideration by H.L. "Sam" Queen, B.S., M.T.(ASCP), M.A., D.Sc. (Hon.) Health Care Educator

RE: I contend that megadose oral Vitamin C Should be included in the protocol now being developed by IAOMT for protecting patients and dental personnel from the health risks imposed by dental mercury.

**BACKGROUND INFORMATION:** Oral megadose vitamin C has been used successfully to treat nearly every disease condition (regardless of the diagnosis) that commonly afflicts humankind, whether mercury was the cause or not. (Dental patients especially have experienced improvement .1,2 ) It is this fact that led Cameron and Pauling to speculate that megadose vitamin C assists in utilizing the basic ground substance glycosaminoglycans necessary for the physical and chemical integrity of all cells and tissues,3 and vital to the healing mechanism in disease in ener al. Cathcart, on the other hand, attributes the general healing properties of megado se vitamin C to the fact hat vitamin C is the premier free radical scavenger.4

Evidence of the positive effects of megadose oral vitamin C and IV-C in reducing the body burden of mercury:


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