Mercury Waste Water Separators

A lot of that amalgam waste is generated when we drill out old fillings. It is in the form of fine particles that go up the suction lines, and traditionally, it was just sent down the sewer. But waste water authorities in the developed countries noticed that their treatment plants were emitting water that still had too much mercury content. Investigations showed that result even when there were no industries dumping mercury, and found that most of the mercury contamination was coming from dental offices.

Unless something is done to remove mercury from the waste stream before it enters the sewer system, each dental office that uses or removes amalgam fillings acts like a point source of pollution. It’s much cheaper and easier to remove the mercury at the source than it is to try to get it out of sewage water downstream. City mandates and mercury separator services are making great strides in reducing mercury in treated waste water.

City Mandates

**Toronto**

Toronto was the first big city model that demonstrated how a mandatory program of installing amalgam separators in individual dental offices could cut mercury at the sewage treatment plants. In 2002, with 73% compliance, they cut mercury emissions by up to 75%.

**San Francisco**

San Francisco was another. In 2004, they reported cutting mercury in wastewater by 90 percent. But it had to be a mandatory program. Only 1.5 percent of dental offices installed separators when the program was voluntary.

Read the San Francisco’s Dental Mercury Pollution Prevention Program testimony written to Chairman Dan Burton of the Subcommittee on Human Right and Wellness.

**Across the U.S.**

More and more cities in developed countries have demonstrated success in reducing mercury in treated waste water with amalgam separators in dental offices. Finally in 2014, the US Environmental Protection Agency proposed a national rule to mandate amalgam separators in all dental offices across the United States.

**Mercury Separator Services**

More and more jurisdictions around the world are mandating the use of mercury separators for dental offices in their districts. In the developed countries, there are many companies that provide mercury separator services. They can be installed on dental unit vacuum lines, and maintained by any of the dental equipment service suppliers. Most also provide a way to recycle chair side particle traps as well.
Introduction to the
International Academy of Oral Medicine and Toxicology
Fundamentals of Biological Dentistry

The International Academy of Oral Medicine and Toxicology (IAOMT) is an organization for that group of dentists, physicians, and allied researchers who consider biocompatibility to be their first concern and who demand scientific evidence as their key criterion. Members of this group have, since 1984, examined, chronicled, and supported research into the distinctions that can make dental practice more biologically acceptable. This “biological dentistry” attitude can inform and intersect with all topics of conversation in health care where the well-being of the mouth is an integral part of the health of the whole person.

By making distinctions – some obvious, and some subtle – among the available materials and procedures, we can reduce the impact on our patients’ biological responses. Our sense of duty to advocate for the well-being of our patients should make biocompatibility a high priority, and the fact that there are now so many new ways to make dentistry work better gives us the opportunity to do just that.

A more biocompatible approach to oral health is the hallmark of "biological dentistry." In using that term, we are not attempting to stake out a new specialty for dentistry but rather to describe a philosophy that can apply to all facets of dental practice and to health care in general: Always seek the safest, least toxic way to accomplish the mission of treatment, all the goals of modern dentistry, and do it while treading as lightly as possible on the patient's biological terrain.

Fundamentals of Biological Dentistry Syllabus:

Unit 1 and 2: Mercury 101 and 102

Scientific evidence has established beyond any doubt two propositions: 1) Amalgam releases mercury in significant quantities, creating measurable exposures in people with fillings, and 2) Chronic exposure to mercury in the quantity released by amalgam causes physiological harm.

Amalgam–derived mercury distributes throughout the body. It crosses the blood-brain barrier, passes through the placenta, and goes into breast milk, resulting in measurable
exposure to infants, who are more susceptible to the negative effects than adults. No one has disputed this. Dentists and dental staff members themselves have been shown to be adversely affected by their occupational mercury exposure. Toxicologists have not been able to detect a minimum level of exposure at which there is no adverse physiological effect.

Very few of the experimental studies on effects of mercury have used amalgam as the mercury source, so we are left to infer that amalgam is toxic because it is a source of mercury exposure. The inference is compelling! Imagine applying to a regulatory agency now for permission to market a new implantable material that is 50% mercury and releases micrograms of this neurotoxin per day! And in this day and age, when you can no longer buy mercurochrome and a broken thermometer in the school nurse’s office results in a mass evacuation and a hazmat emergency, why should we go on exposing people to mercury when there are so many other methods of restoring teeth? From a practical standpoint, amalgam is totally unnecessary. From a biocompatibility standpoint, it is totally insupportable.

However, the leaders of “organized” dentistry persist in maintaining the old party line. They claim that amalgam is a stable material. In doing so, they make comments such as “Mercury is released in an amount too small to harm anyone,” “The only adverse effects are very rare allergic reactions,” “No scientifically valid evidence exists to demonstrate negative effects,” “Reports of negative effects are ‘junk science,’” and “Mercury exposure from amalgam has never been proved to cause any recognized human disease.” None of these statements can be supported scientifically, and, in fact, the great preponderance of worldwide scientific evidence squarely contradicts the notion of amalgam safety. It’s all a pure red herring. No one claims, for example, that lead causes a recognized disease other than lead poisoning, but we know enough to avoid it.

It’s all in the scientific literature, although this information is rarely mentioned in dental journals except in the form of editorial rebuttals. The evidence is instead published in many of the world’s leading medical journals, where it has remained hidden from the independent dentist and the public alike.

Unit 3: Safe Removal of Amalgam Fillings

Dentists who engage in elective replacement of amalgam fillings have been criticized by their peers for unnecessarily exposing their patients to additional mercury during the process of grinding the old fillings out. Yet, the “mercury-free” dentists are the ones who are most aware of the problem. We present scientifically verified procedures for minimizing mercury exposure which all dental office personnel should learn and follow for their own protection and for the protection of their patients.

Unit 4: Environmental Impact of Dental Mercury

Wastewater authorities around the world are on to dentists. Dental offices have been collectively identified as the major source of mercury pollution in municipal wastewater, and they’re not buying the excuse that amalgam is stable and doesn’t break down.
Regulatory action is in place in many jurisdictions requiring dental offices to install mercury separators on their waste water lines. We'll examine the environmental impact of dental mercury. It’s considered a hazardous material before it’s used and a hazardous waste after it’s removed – but not when stored in people’s mouths!

**Unit 5: Clinical Nutrition and Heavy Metal Detoxification for Biological Dentistry**

Nutritional status impacts all aspects of a patient’s ability to heal. Biological detoxification depends heavily on nutritional support, as does periodontal therapy or any wound healing. While the IAOMT does not advocate that dentists necessarily become nutritional therapists themselves, an appreciation of the impact of nutrition on all phases of dentistry is essential to biological dentistry.

The IAOMT also recommends that dentists ally themselves with medical practitioners who are qualified to provide biological support and detox services. That is why we encourage MD’s, DC’s, ND’s and RN practitioners to become members and to be involved with our quest to provide better levels of health care.

Thus, all members should be familiar with the methods and challenges of reducing systemic toxicity deriving from mercury exposure. For some patients, eliminating the exposure by removing the amalgam fillings is sufficient; for others, it is just the tip of the iceberg. Practitioners and patients can choose among several strategies for enhancing the body’s own ability to excrete the toxins, for chelating them out with drugs, and for sequestering them to counteract harmful effects. Such strategies are best deployed in a whole body context.

**Unit 6: Biocompatibility and Oral Galvanism**

In addition to using dental materials that are less overtly toxic, we can raise the biocompatibility quotient of our practice by recognizing the fact that individuals vary in their biochemical and immunological responses. We present a discussion of biochemical individuality and sound methods of immunological testing to help determine the least reactive materials to use with each individual patient. The more a patient suffers from allergies, environmental sensitivity, or autoimmune diseases, the more important this service becomes.

Aside from their power to provoke immune reactivity, metals are also electrically active. Oral galvanism has been talked about for well over 100 years, but dentists generally ignore it and its implications.
Remember the electromotive scale from inorganic chemistry? Remember the potato clock, where a copper nail and a zinc nail stuck in a potato make enough electricity to run a digital clock?

Dental materials are no different, and here are some representative voltage numbers (standard hydrogen electrode) for typical dental metals:

<table>
<thead>
<tr>
<th>Material</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium</td>
<td>-1.63</td>
</tr>
<tr>
<td>Chromium</td>
<td>-0.74</td>
</tr>
<tr>
<td>Nickel</td>
<td>-0.26</td>
</tr>
<tr>
<td>Silver</td>
<td>0.79</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.85</td>
</tr>
<tr>
<td>Palladium</td>
<td>0.95</td>
</tr>
<tr>
<td>Gold</td>
<td>1.69</td>
</tr>
</tbody>
</table>

This simple chart establishes that combining gold and titanium in an electrolyte like saliva can, under some circumstances, create a battery of over three volts! This is very oversimplified, so if you want all the details, ask a corrosion chemist, but considering that the nervous system works on membrane potentials of 0.140 volts, electricity from dental metals that is conducted through anatomical structures and spaces can overwhelm normal neuronal control. Often the manifestation is localized pain, development of lichenoid lesions, or inappropriately elevated muscle tone as in jaw tension, TMJ, temporal headache, or skin pallor due to low level vasoconstriction, etc.

**Unit 7: Fluoride**

Mainstream public health science has failed to verify that a protective effect of water fluoridation on children’s teeth actually exists, despite the constant public relations statements and resulting widespread belief among the general population. Some of the articles are bizarre in that they start off with the assertion that fluoridation of public water supplies is among the most important public health measures ever devised but then go on to say that it doesn’t actually work. What are we to make of the statistics showing that non-fluoridated communities and the non-fluoridated continent of Europe have experienced the same reduction in tooth decay as fluoridated ones? Obviously, something’s going on to reduce rates of tooth decay in the developed world, but it’s not fluoride. Meanwhile, evidence of the harmful effects of fluoride accumulation in the
human body continues to mount. Any honest appraisal of the risks and benefits of water fluoridation ends with the conclusion that it must be stopped.

**Unit 8: Biological Periodontal Therapy**

Pathogenic microbes and the link between oral pathogens and systemic disease, have captured our imagination. At times it almost seems as if a tooth with its root canal system and leaky gums is a device for injecting pathogens into internal spaces where they don't belong. Are the methods we typically use to disinfect diseased gums and root canals really the best at getting rid of them?

We will revisit the dentinal tubule and the periodontal pocket with the question of which techniques are the most anti-infective. Where is a line to be drawn in periodontal therapy to distinguish the biological approach from the basic mechanical therapies that prevail in dentistry? Primarily, it is the line between those therapies that involve excision of tissue, and those that involve enabling those tissues to heal. Periodontal disease is recognized principally as an infection, and it is treated as such by detecting and eliminating pathogens and providing nutritional support to make it possible for affected tissues to heal.

Methods used to detect pathogens and monitor their numbers through the course of treatment range from the basic clinical exam to the classic use of a phase contrast microscope to the BANA test and DNA probes.

Therapeutic choices go beyond basic hygiene methods. There are non-drug procedures for eliminating the infection, as well as occasional judicious use of anti-microbial drugs. Laser treatment, ozone treatment, home care training in pocket irrigation, and nutritional support all are useful with adequate monitoring of the status of the infection.

**Unit 9: Root Canals**

There is controversy once again in the public’s consciousness over root canal treatment. The origin lies in the question of remnant populations of microbes in the dentinal tubules and whether or not endodontic techniques adequately disinfect them or keep them disinfected. We also examine how those bacteria and fungal organisms can turn anaerobic and produce highly toxic waste products that diffuse out of the tooth, through the cementum, and into circulation.

Despite the fact that there are serious objections to the use of root canal treatment in dentistry, the fact remains that it is an ingrained part of our professional culture. It was easy to convert to mercury–free restorative dentistry once good alternatives became available, but the only alternative to root canal treatment is extraction, and our patients have been trained by the greater society to expect to keep their teeth. Even highly aware and health conscious patients can become confused by the conundrum of whether to lose a tooth or keep it by means of a root canal treatment.

Can there be a middle ground between the prevailing uncritical trust in root canal therapy, and the objectors’ view that no root treated tooth can be tolerated, that all must
be extracted? Are all teeth and all patients the same in this regard? Are there methods that can mitigate the known stresses that root canal treatments place on the body?

**Unit 10: Jawbone Osteonecrosis**

What is a “simple extraction,” and does pulling a tooth always lead to adequate healing?

Recent work in the field of facial pain syndromes and Jawbone OsteoNecrosis (JON) has led to the realization that the jawbones are a frequent site of ischemic osteonecrosis, also known as aseptic necrosis, the same as is found in the femoral head. As a result, many extraction sites that appear to have healed have actually not healed completely and can trigger pain in other parts of the face, head, and distant parts of the body. Even though most of these sites actually present with no symptoms at all, pathological examination reveals a combination of dead bone and slowly growing anaerobic pathogens in a soup of highly toxic waste products where we would otherwise think there has been good healing.

The incidence is alarmingly high. Researchers in the field have implicated such diverse factors as oral surgery techniques and overly expressed clotting factors, both endogenous and microbial, in its pathogenesis. This is a newly emerging disease entity, although the phenomenon of “bone caries” was known and written about in the days of G. V. Black over one hundred years ago. Diagnostic criteria and treatment methods are in the early stages of development, as are methods for preventing routine extractions from becoming osteonecrotic lesions. Yet, it’s already clear that this is going to be a big issue in the future, and it may ultimately force us to totally re-evaluate our understanding of the relationship between the tooth and the bone.

**Conclusion: We are Twenty-First Century Dentistry**

In the old days, when the only restorative materials were amalgam or gold and the only esthetic material was denture teeth, our profession was challenged to fulfill its mission and be biologically discriminating at the same time. Today, we can do better dentistry, in a less toxic, more individualized, and more environmentally-friendly way than ever. We have as many choices of attitude before us as we do dental techniques and materials. By choosing to put biocompatibility first, we can look forward to practicing effective dentistry while knowing that we are providing patients with the safest experience for their overall health.