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John MacLeod, Chair
Board Members
Occupational Safety and Health Standards Board
2520 Venture Oaks Way, Suite 350
Sacramento, CA 95833

March 20, 2008

Re: Petition to adopt vertical standard for placement, removal, and polishing of dental mercury amalgam

Chairman MacLeod and Members of the Board,

Injury to dental workers from occupational exposure to mercury is no longer a matter of speculation. Dental procedures involving the use and manipulation of mercury are so inherently dangerous that they represent extreme risk to employees

Mercury is relatively non-toxic in liquid form, since its absorption in human tissue is low.

However, liquid mercury when heated is converted to an odorless, colorless, tasteless gas that can destroy neurons, and causes fetal death, neurological harm and dysmenorrhea.

During the mixing for placement of a new mercury/silver filling, the amalgam triturator rapidly vibrates the mixture with a steel pestle to mix the components, generating heat. When the dental assistant opens the mixing capsule, mercury vapor in excess of 1000 PPM is released in the vicinity of the assistant's hands, far exceeding the California Maximum Allowable Concentration (MAC) of 100µg/m³.

Elemental mercury vapor is one of the most toxic substances to mankind, because its absorption across the lung is 80% or greater, and in the elemental form it is fat-soluble and readily crosses the blood-brain barrier.

Thus it can enter the brain, fetus, and even neurons where it accumulates adjacent to the nucleus and mitochondria. There, science shows it adversely affects every enzymatic reaction that involves a sulfur-containing protein (approx 100%).

Research on California dental assistants in 1994 confirmed that their occupational exposure to mercury, well below the TLV, was responsible for a 40% increase in infertility.

Surveys of umbilical cord blood by the US EPA have determined that a woman with a blood mercury level above 4 micrograms per deciliter ($\mu\text{g}/\text{dL}$) will likely deliver a brain-damaged child. A correlation with the financial effects estimated that this injury is costing this nation \$8.7 billion due to lower IQ.

Surveys of dental students and dental school employees found that their blood mercury is truly enormous, with some above 150 $\mu\text{g}/\text{dl}$. The surveys found the mercury level rising for each year of study, rising from September to May while at school, and declining during the summer vacation. All the employees experienced this increase in blood mercury. Considering the EPA's findings, any woman thus employed, who becomes pregnant, risks delivering a brain damaged child.

Mercury vapors generated during the removal or even polishing of existing mercury amalgams -- additional heat generating activities -- because of the volume of these activities performed each workday, produce a constant exposure, even in those offices that no longer place mercury amalgams.

The absence of a vertical standard by OSHSB for working with mercury amalgam in the dental workplace or school leaves workers negligently unprotected from known and reasonably anticipated risks, and presents several additional dilemmas:

- 1) The political rhetoric surrounding the advisability of placing or not placing mercury amalgams diverts attention from the need to protect workers in all phases of exposure, thus the absence of a vertical standard leaves the worker prey to political machinations rather than science-based determinations of practices conducive to health and safety

2) Workers have been taught that they must read and thus rely on protections required by OSHSB through the requirement that the employing dentist provide readily-accessible notices, warnings, and informed consent. The absence of a vertical standard is perceived as a position by OSHSB.

3) An employing dentist is a learned intermediary for every product used in the dental workplace, assuming liabilities for exposures, and warnings, to employees -- a fact that is reinforced by this Board's many requirements. The limitations on the employer's responsibilities to employees as a learned intermediary are tempered by an assessment of the employee's "sophistication" as a user that can discern the dangers. Without a vertical standard that both informs and establishes protective use guidelines, the employee has no opportunity to gain user sophistication, or to protect themselves accordingly.

4) An employing dentist that heeds the current science, and informs the employee of the risks at their hiring, or provides protections beyond the industry norm, suffers from an unfair competition with those other employing dentists who are not aware or that do not inform, based on their reliance on standards established by OSHSB. In effect, the absence of a vertical standard that incorporates available science, which should be applied to all participants in the industry, intrudes on the very learned intermediary responsibilities that the mission of OSHSB is intended to encourage.

5) In today's climate of partisanship concerning the advisability of placing mercury amalgams, an employing dentist may be threatened by the possibility of being accused of practicing medicine without a license upon offering information about risks from handling of dental amalgams to employees when that information is not addressed by OSHSB.

We, the petitioners named below, herein assert that it is incumbent on this Board to incorporate current science into the protective standards established by OSHSB, and hereby request that this Board adopt a vertical standard as identified in the document and videotape attached and presented by David C. Kennedy, DDS on behalf of the International Academy of Oral Medicine and Toxicology, which we hereby incorporate as a part of this petition.

Respectfully,

Chet Yokoyama, DDS, practicing dentist, and past Member of the Dental Board of California;

David C. Kennedy, DDS, retired dentist, past President of the International Academy of Oral Medicine and Toxicology; and

Jeff Green, owner and operator of Jeff Green & Associates, a management consulting firm having provided services to more than 400 dental offices and more than 2000 employees.