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Amalgam Fillings: Do Dental Patients Have a Right to Informed Consent?*

Michael A. Royal**

Introduction

An individual may seek the services of a dentist for any number of reasons. After examination, the dentist may determine that the patient has a cavity and inform the patient that the cavity must be filled.

Dentists usually do not consult patients to determine what materials to use. Most feel that dialogue with the patient on this issue is unnecessary. However, some materials may be hazardous under certain conditions. New research suggests that mercury amalgam (or "silver") fillings (hereinafter amalgam) may fall into that category.

However, the American Dental Association (ADA) supports the use of such fillings and assures "the American people that dental amalgam is safe."¹ The ADA claims that since mercury amalgam has been used

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¹ H. QUEEN, CHRONIC MERCURY TOXICITY: NEW HOPE AGAINST AN ENDEMIC DISEASE 24 (1988) (quoting Dr. Donald E. Bentley, ADA President, Bureau of Communications, 211 East Chicago Avenue; Chicago, Illinois 60611) (*Special News Release II: ADA President Underscores Safety of Dental Fillings*, 1983). See also, COUNCIL ON DENTAL MATERIALS, INSTRUMENTS, AND EQUIPMENT, COUNCIL ON DENTAL THERAPEUTICS, *Safety of Dental Amalgam*, 106 J.A.D.A. 519, 520 (1983) ("the use of mercury in dental amalgam restorations is safe for patients.") [hereinafter

for over 150 years, its safety should not be disputed.² While its position remains largely unsupported by scientific evidence, the ADA challenges those opposed to the use of amalgam fillings (anti-amalgamists) to produce scientific evidence that its use is harmful to humans.³ This challenge has been accepted. The anti-amalgamists have countered by challenging the ADA to demonstrate that safe levels of mercury in human tissues exist before endorsing its use.⁴ The ADA has yet to respond. Both sides do, however, agree that “[1] [mercury] is

Safety of Dental Amalgam].

² See *infra* note 139.

³ See Friedman, *Safety of Dental Amalgam*, 260 J.A.M.A. 2295, 2296 (1988) (“There is no evidence that the presence of amalgam restorations poses any risk to the patient.”). See also, *Special Report: When Your Patients Ask About Amalgam*, 120 J.A.D.A. 398 (1990) [hereinafter *Special Report*].

⁴ H. QUEEN, *supra* note 1, at 24. “Suspected chronic exposure to mercury from dental amalgam should no longer be questioned.” *Id.* at 22 (citing Vimy & Lorscheider, *Serial Measurements of Intra-oral Air Mercury: Estimation of Daily Dose from Dental Amalgam*, 64 J. DENT. RES. 1072 (1985)). See also, H. HUGGINS & S. HUGGINS, IT’S ALL IN YOUR HEAD 9 (1985) (“In the hundred of articles we have accumulated on mercury in the body[,]... we have not been able to find even one that would support the claim that mercury is harmless to the patient.”); Hahn, Kloiber, Vimy, Takahashi & Lorscheider, *Dental ‘Silver’ Tooth Fillings: A Source of Mercury Exposure Revealed By Whole-Body Image Scan and Tissue Analysis*, 3 FEDERATION AM. SOCIETIES FOR EXPERIMENTAL BIOLOGY J. 2641 (1989) [hereinafter *Dental ‘Silver’ Tooth Fillings*] (footnotes omitted) (“[C]lear experimental evidence regarding its safety has not been demonstrated.”); INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, A SCIENTIFIC RESPONSE TO THE AMERICAN DENTAL ASSOCIATION’S SPECIAL REPORT AND STATEMENT OF CONFIDENCE IN DENTAL AMALGAM 1 (1990) (“In the interest of public safety, we reaffirm our 1985 position that the use of... mercury/silver fillings should be discontinued until such time as primary pathological evidence of amalgam safety is produced.”); CBS News, “*Is There Poison In Your Mouth?*”, 14 *60 Minutes* 2, 3 (CBS television broadcast, Dec. 16, 1990) (transcript may be obtained from CBS News, 60 Minutes Transcript, 542 West 57th Street, New York, New York 10019; transcript on file at Princeton University General Library, University of Michigan General Library, and University of Iowa General Library) [hereinafter *60 Minutes*] (Dr. Murray Vimy, researcher and dentist at the University of Calgary Medical School stated: “This issue is, chronic exposure, low dose, to a heavy metal.... [N]o one has ever really looked at that aspect of mercury exposure.”).

one of the most poisonous elements known to man, and [2] mercury amalgam may cause ill effects in those people who are mercury sensitive.”⁵

The mercury used in fillings is hazardous before and during their preparation.⁶ Also, *scrap* materials pose an environmental hazard when discarded.⁷ Research over the past decade demonstrates that their use poses a *potential* health hazard to a significant number of the estimated 200 million Americans with amalgam fillings.⁸ Amalgam continues to be the primary filling material in the U.S., largely due to the ADA’s endorsement.⁹

This article will first examine the history and general issues involved in the use of amalgam fillings. Second, it will review available research to demonstrate the potential health hazards. Third, it will briefly investigate environmental issues and suggest that potential risks extend beyond those posed for patients. Ultimately, the article will address whether, whatever uncertainty may be present, patients do not have a right to be informed of potential risks and of available alternatives.

⁵ H. QUEEN, *supra* note 1, at 24. See W. SHAFER, M. HINE & B. LEVY, A TEXTBOOK OF ORAL PATHOLOGY 578 (4th ed. 1983) (“A toxic reaction from absorption of mercury in dental amalgam has been reported on a number of occasions.... [T]his exposure may suffice to bring about allergies manifestations in patients sensitive to the mercury....”); D. SMITH & D. WILLIAMS, 3 BIOCOMPATIBILITY OF DENTAL MATERIALS 29 (1982).

⁶ R. CRAIG, W. O’BRIEN & J. POWERS, DENTAL MATERIALS: PROPERTIES AND MANIPULATION 94 (4th ed. 1987) (“If mercury is improperly handled in the dental office, a health hazard may result from (1) systemic absorption of liquid mercury through the skin, (2) inhalation of mercury vapor, and (3) inhalation of airborne particles.”).

⁷ See *infra* note 140.

⁸ See *infra* note 55.

⁹ Lee, *Two Studies Suggest Risk From Silver Fillings*, Chicago Tribune, Aug. 15, 1990, section 1, at 1, col. 2.

History of Amalgam Fillings

Opponents of amalgam have challenged its use in dentistry since its introduction over 150 years ago.¹⁰ The first reported use in dental restorations was in 1818.¹¹ Since then, concerns over the toxic effects of mercury have persisted.¹² The American Society of Dental Surgeons, formed in 1840,¹³ so abhorred the use of amalgam that it required its members to sign pledges that they would not use it.¹⁴ In 1848, The Society of Dentists of the City and State of New York suspended eleven of members for "malpractice," because they used amalgam.¹⁵ Internal strife over the use of mercury in dentistry led to the formation of the ADA, whose leaders did not oppose its use.¹⁶

In the late 1920's, anti-amalgamists challenged the use of amalgam again, as evidence surrounding the toxic effect of certain mercury compounds "appeared indisputable."¹⁷ Despite this, the use and popularity of amalgam in dentistry continued to grow rapidly.¹⁸ Questions about its safety arose again about fifteen years ago and

¹⁰ H. QUEEN, *supra* note 1, at 15.

¹¹ D. SMITH & D. WILLIAMS, *supra* note 5, at 20. See *Dental Fillings Cited as Environmental and Health Hazard*, PR Newswire, Raleigh, N.C., Apr. 5, 1990 (The use of amalgam fillings won popularity as a substitute for gold and toxic lead fillings); J. TAYLOR, *THE COMPLETE GUIDE TO MERCURY TOXICITY FROM DENTAL FILLINGS* 189 (1988) ("Although the detrimental effects of mercury were well known in the 1800's, there was no inexpensive substitute for gold fillings except for the silver mercury fillings.")

¹² D. SMITH & D. WILLIAMS, *supra* note 5.

¹³ J. TAYLOR, *supra* note 11, at 189.

¹⁴ *Id.*

¹⁵ *Id.* at 188 (citing M. RING, *DENTISTRY: AN ILLUSTRATED HISTORY* (1985)).

¹⁶ *Id.* at 188.

¹⁷ I. MJÖR, *DENTAL MATERIALS: BIOLOGICAL PROPERTIES AND CLINICAL EVALUATIONS* 22 (Oslo, Norway, 1985).

¹⁸ *Id.*

continue unabated.¹⁹ Nevertheless, mainstream dentistry believes it is “most unlikely” that the current “anti-amalgam crusade” will succeed in eliminating its use.²⁰

Amalgam fillings typically comprise 50% pure elemental mercury, 35% silver, 13% tin, 2% copper, and a trace of zinc.²¹ The metal powders react with liquid mercury to produce an amalgam (or alloy)²² that provides a flexible material that can be easily packed and shaped.²³ Amalgam fillings are often called *silver fillings* because of appearance and composition.²⁴

The ADA prefers the use of amalgam because fillings are inexpensive and durable, while gold and other composite materials are more expensive and more difficult to fit.²⁵ Because of its flexibility, the use of amalgam arguably requires less skill. Thus, dentists can

¹⁹ *Id.*

²⁰ *Id.* See also, R. CRAIG, W. O'BRIEN, J. POWERS, *supra* note 6, at 94 (“Until more esthetic restoratives that can function in stress-bearing areas are developed, amalgam will continue to be used.”).

²¹ *Dental ‘Silver’ Tooth Fillings*, *supra* note 4, at 2641.

²² R. CRAIG, W. O'BRIEN, J. POWERS, *supra* note 6, at 94. “The hardening of the amalgam is the result of two phenomenon — solution and crystallization. When mercury initially comes into contact with the alloy, the particles are moistened by the mercury and they begin to absorb it.... The final result... is an amalgam with... superior properties.” *Id.* at 97.

²³ *Id.* at 94.

²⁴ *Id.* (“Mercury is a dense liquid metal that is highly toxic. Mercury of high purity possess a shiny surface.”). See also, D. SMITH & D. WILLIAMS, *supra* note 5, at 21 (“The purity of dental mercury in the ADA specification is defined by the surface appearance, the residue after pouring, and the nonvolatile residues. Mercury that has a clean surface with mirror-like appearance and pours cleanly can be used satisfactorily for dental purposes.”).

²⁵ *Special Report*, *supra* note 3. See also, *County Says Dentists Are Dumping Excess Mercury*, *Arizona Daily Star*, Oct. 16, 1989, at B1, col. 1. “If we can’t use the mercury amalgam, we’ll have to use gold — and a \$30 filling will cost \$200 or more.” *Id.* (quoting Richard Simoneaux, a Tucson dentist and Southern Arizona Dental Society President).

usually fill a cavity in less time.²⁶ Some, however, believe that alternatives that have been available for several years, may be even stronger and more durable.²⁷ One author proclaimed over fifteen years ago that since “satisfactory alternative tooth-filling materials are available, ... the use of amalgam fillings should be discouraged.”²⁸ However, the ADA maintains that there are no acceptable substitutes,²⁹ although it admits, “the use of composite resins as a posterior restorative material may eventually replace amalgam restorations.”³⁰ In fact, the ADA recognizes that once an “acceptable” replacement for amalgam is found, that “even the possible hazard to dental office personnel of high

²⁶ See generally *id.*

²⁷ See Choulos & Weiner, *It is More Probable Than Not That We will Soon Become Mad As Hatters, or The Legal and Health Effects of the Use of Dental Amalgams*, 4 San Francisco Barrister 10, 13 (Jun. 1985).

Advantages of Using Enamel and Dentin Bonding composites vs. Amalgams: They contain no mercury.... They are more thermally insulating and protect the pulp better from temperature changes. They attain full strength very quickly and thus reduce failure from lack of strength and permit finishing and polishing to be done during one placement and appointment. Preparations may be more conservative with less tooth structure lost; little mechanical retention necessary by bonding to tooth structure; and tooth strength increases rather than decreases. No corrosion products are created. Composites have very good esthetics. There is extremely limited marginal leakage.

Id. (quoting M. Ziff, D.D.S., J.E. Hardy, M.D., presentation to Florida Academy of General Dentistry (July 23, 1983)) (emphasis added). See also, Peterson, *FDA May Take Closer Look at Silver Fillings' Safety*, USA Today, Oct. 24, 1990, at D4, col. 1 (David Eggleston of the University of Southern California School of Dentistry stated that, “Dental amalgams will [soon] be phased out because of better materials that will be available at the same cost.”).

²⁸ L. DICKEY, CLINICAL ECOLOGY 295 (1976).

²⁹ One ADA expert writes: “The profession has been using amalgam for more than 150 years, and some of these newer materials have been around for only a decade or less, so we don’t have the longstanding of safety with them that we have with amalgam.” *Special Report*, *supra* note 3, at 396.

³⁰ NATIONAL INSTITUTE OF DENTAL RESEARCH, *Workshop: Biocompatibility of Metals in Dentistry*, 109 J.A.D.A. 469, 471 (1984) [hereinafter *Biocompatibility*].

levels of mercury vapor from mercury spills could be eliminated.”³¹

The ADA adamantly defends mercury usage in tooth restorations whenever others suggest that it poses a potential health threat on the basis that it has been used “safely” over the past 150 years.³² Other reasons behind its support of amalgam may include: 1) ease of use; 2) low cost; 3) additional training and equipment required to use alternative materials;³³ and 4) potential liability associated with acknowledging the dangers of amalgam previously used. Unfortunately, the cost of a vast array of chronic, degenerative, mental and physical diseases related to mercury exposure in patients, dentists, dental personnel and society appears to be immeasurable.

Mercury Toxicity

Mercury has been known to be a poison for thousands of years,³⁴ whether “ingested, inhaled, or absorbed through the skin.”³⁵ In the 1800’s, British workers who used mercury in the hat making process developed symptoms of mental deterioration on an industry-wide basis.³⁶ The expression, “mad as a hatter,” originated from that.³⁷ Also, citizens of Minamata, Japan, endured ten years of misery, crippling deformities and agonizing deaths before industries ceased

³¹ *Safety of Dental Amalgam, supra* note 1, at 520.

³² *Supra* note 29.

³³ “If you took amalgam off the market tomorrow, a good 40 percent of the American dentists who belong to the American Dental Association would have to be retrained, because in their practices, the prime [material] that they use is dental amalgam.” *60 Minutes, supra* note 4, at 10 (quoting Dr. Murray Vimy, researcher & dentist from University of Calgary Medical School).

³⁴ D. SMITH & D. WILLIAMS, *supra* note 5, at 20 (Mercury toxicity was observed in humans as early as 380 B.C.).

³⁵ H. QUEEN, *supra* note 1, at 15 (emphasis in original).

³⁶ L. DICKEY, *supra* note 28, at 294.

³⁷ *Id.* at 294 (The Mad Hatter, in Alice in Wonderland “had the characteristic slurred speech of the worker in the industry.”). *See also*, H. QUEEN, *supra* note 1, at 16.

polluting the local harbor with mercury.³⁸ The mercury was transferred to Minamata citizens when they consumed fish from the polluted harbor. This resulted in more than 10,000 cases of "Minamata disease," which had a 10% mortality rate.³⁹ Today, according to those involved in research, human exposure to mercury is primarily through dental amalgam.⁴⁰

Mercury has been found to accumulate in vital organs and tissues, such as the liver, brain,⁴¹ and heart muscle.⁴² Major symptoms of mercury toxicity include emotional instability, tremors, gingivitis, and kidney failure.⁴³ Some also believe mercury may be linked to multiple

³⁸ Ingalls, *Endemic Clustering of Multiple Sclerosis in Time and Place, 1934-1984*, 7 AM. J. FORENSIC MED. & PATHOLOGY 3, 6 (1986).

³⁹ *Id.*

⁴⁰ See Vimy, Luft & Lorscheider, *Estimation of Mercury Body Burden from Dental Amalgam Computer Simulation of a Metabolic Compartment Model*, 65 J. DENT. RES. 1415 (1986); *Drilling for Danger?*, Newsweek, Oct. 15, 1990, at 80 ("fillings can be the largest single source of exposure to inorganic mercury"). See also, *Mercury — An Element of Mystery*, 323 NEW ENG. J. MED. 1137, 1139 (editorial by Thomas W. Clarkson, Ph.D., M.D.) ("Amalgam tooth fillings are... possibly the chief source of exposure of a large segment of the U.S. population.").

⁴¹ D. SMITH & D. WILLIAMS, *supra* note 5, at 33. See also, Eggleston & Nylander, *Correlation of Dental Amalgam with Mercury in Brain Tissue*, 58 J. PROSTHETIC DENT. 704 (1987) ("Organic mercury compounds and elemental mercury vapor can cause central nervous system damage, and long-term exposure to inorganic (metallic) mercury vapor from dental amalgam may increase the brain tissue concentration of the neurotoxic metal."); *Mercury — An Element of Mystery*, *supra* note 40, at 1138 ("Autopsy data indicate that brain mercury levels are approximately twice as high in people who have had fillings for many years as in those with no fillings....").

⁴² H. QUEEN, *supra* note 1, at 20.

⁴³ D. SMITH & D. WILLIAMS, *supra* note 5, at 20. See also, Vimy, Takahashi & Lorscheider, *Maternal-Fetal Distribution of Mercury (203Hg) Released From Dental Amalgams*, 27 AM. J. OF PHYSIOLOGY: REGULATORY, INTEGRATIVE & COMPARATIVE PHYSIOLOGY R944 (1990) [hereinafter *Maternal-Fetal Distribution*] (footnote omitted) ("Both kidney and liver were shown to be major sites of Hg deposition when human subjects inhaled [mercury] vapor from a nonamalgam source, and kidney and brain are considered to be critical target organs for Hg vapor effects.").

sclerosis⁴⁴ and epileptic seizures.⁴⁵ Further, its affect on the body's immune system is potentially devastating,⁴⁶ possibly contributing to diseases such as leukemia and hematopoietic dyscrasias.⁴⁷

No direct connection to any specific diseases has yet been made, primarily "because no one has really looked."⁴⁸ However, as research continues, evidence is accumulating. Dental fillings may yet prove to have effects many times greater than those found at Minamata.⁴⁹

Patient Exposure to Mercury from Amalgam Restorations

Dentists maintain that mercury in "amalgam becomes inert once the fillings have been allowed to set for several days, and that long-term danger to the patient from [mercury] vapor is therefore remote."⁵⁰ The

⁴⁴ See Ingalls, *supra* note 38, at 3. See also, Lee, *supra* note 9; 60 Minutes, *supra* note 4, at 4-5 (clinical evidence demonstrated some sufferers from multiple sclerosis were dramatically cured or relieved soon after removal of their amalgam fillings).

⁴⁵ H. QUEEN, *supra* note 1, at 253.

⁴⁶ Eggleston, *Effect of Dental Amalgam and Nickel Alloys on T-lymphocytes: Preliminary Report*, 51 J. PROSTHETIC DENT. 617, 619 (1984) (footnotes omitted) ("An abnormal T-lymphocyte percent of lymphocytes or a malfunction of T-lymphocytes can increase the risk of cancer, infectious diseases, and autoimmune diseases.").

⁴⁷ Huggins, *Proposed Role of Dental Amalgam Toxicity in Leukemia and Hematopoietic Dyscrasias*, 11 INT. J. BIOSOCIAL & MED. RES. 84 (1989). See also, Royal, *When Traditional Oriental or Modern Medicine Fail: Could Dental Amalgams Be Contributing to Our Declining Health ?*, 18 AM. J. ACUPUNCTURE 205, 210 (1990) ("Chronic mercury intoxication, like syphilis, can mimic many different diseases as it slowly destroys cells, tissues and organs....").

⁴⁸ See *Drilling for Danger?*, *supra* note 40.

⁴⁹ "It is believed that dental amalgams constitute the major source of exposure to inorganic Hg in the general population." Hahn, Kloiber, Leininger, Vimy & Lorscheider, *infra* note 115, at 3256 (footnote omitted).

⁵⁰ *Dental 'Silver' Tooth Fillings*, *supra* note 4, at 2641 (footnote omitted). See also, R. CRAIG, W. O'BRIEN & J. POWERS, *supra* note 6, at 97. It should be clearly understood... that once amalgamation occurs, for all practical purposes, no free (unreacted) mercury is associated with the amalgam restoration. The mercury in an amalgam is alloyed with silver or tin and no longer has the toxic properties of

New England Journal of Medicine recently reported, "Many important medical questions concerning mercury toxicity remain to be answered."⁵¹ The ADA, by contrast, continues to assert that it has enough information to guarantee its safety for use.⁵²

Nevertheless, dentists admit that there is exposure to mercury vapor,⁵³ and the ADA acknowledges that an allergic reaction poses "[a] small but possible risk to the patient."⁵⁴ However, approximately eleven million Americans are mercury sensitive.⁵⁵ Further, the ADA

unreacted mercury. If, however, amalgam is heated beyond approximately 80 C, liquid mercury can form on the surface of the amalgam, and its vapor can present a health hazard. *Id. But see Biocompatibility, supra* note 30, at 470 ("Additional studies in this area are required to more accurately assess the possible risk to patients."); INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 3 (citing Stock, *Die Gefährlichkeit des quecksiberdampfes*, 39 Z. AGNEW CHEM. 461 (1926)) ("Published experimental evidence as early as 1926 has demonstrated that mercury is not locked in, but is released from fillings.") .

⁵¹ *Mercury — An Element of Mystery, supra* note 40, at 1138.

⁵² *Supra* note 1.

⁵³ One author writes:

[T]here are ample experimental data which show that measurable amount of mercury vapor is released from both newly placed and aged amalgams.... [However,] the available evidence suggests that the health hazards of mercury to patients from amalgam restorations are negligible, with the exception of allergic reactions.... The potential danger to patients from mercury vapor inhalation in the dental office is considered remote because of the short duration of the office visit.

D. SMITH & D. WILLIAMS, *supra* note 5, at 28–29.

⁵⁴ R. CRAIG, W. O'BRIEN, J. POWERS, *supra* note 6, at 95. *See* W. SHAFER, M. HINE & B. LEVY, *supra* note 5.

A toxic reaction from absorption of mercury in dental amalgam has been reported on a number of occasions.... [A] thorough review of the literature and numerous studies on the absorption and excretion of mercury [indicates] that the amount of estimated exposure to mercury from dental amalgam is not sufficient to cause mercury poisoning in the conventional sense. Nevertheless this exposure may suffice to bring about allergies manifestations in patients sensitive to the mercury....

Id. See also, I. MjÖR, *supra* note 17, at 24 ("allergy to mercury is a real, reported, and documented side effect. However, its frequency is low and the clinical symptoms are usually of insignificant nature.").

agrees that the removal of amalgam fillings “can release relatively large amounts of mercury into the mouth[,] and that may be harmful.”⁵⁶

While de-emphasizing possible risks to patients, the ADA has taken affirmative steps to inform dentists and their personnel of the potential hazards of mercury⁵⁷ and has established strict guidelines for storing and handling amalgam.⁵⁸ One author suggests that dentists have both a

⁵⁵ See *Dental ‘Silver’ Tooth Fillings*, *supra* note 4, at 2645 (footnote omitted) (“In North America 5.4% of the population display contact hypersensitivity to Hg [mercury].”).

⁵⁶ Richards, *Maverick Dentists Question Safety of Typical Fillings*, Wall St. J., Nov. 28, 1988, at B1, col. 5. See also, *Biocompatibility*, *supra* note 30, at 470 (“Studies have demonstrated that patients are exposed to mercury vapor when amalgams are placed as a restoration....”); Peterson, *supra* note 27 (quoting David Eggleston, researcher and dentist with the University of Southern California School of Dentistry) (“when amalgam is removed, ‘there is a temporary elevation of mercury in the blood.... The first trimester of pregnancy would be of particular concern.”); *infra* note 79 (regarding threats to pregnant women and mercury exposure).

⁵⁷ See ADA Advertisement, *Protect Yourself and Your Staff... Against One of the Hazards of Your Profession With the ADA’s Mercury Testing Service* (copy available from American Dental Association, Council on Dental Research, 211 East Chicago Ave., Chicago, Illinois, 60611 1985); Brodsky, Cohen, Whitcher, Brown, Jr. & Wu, *Research Reports: Occupational Exposure to Mercury in Dentistry and Pregnancy Outcome*, 111 J.A.D.A. 779, 780 (1985) (“For dental personnel, mercury is absorbed directly into the body through handling and by inhalation of mercury vapors.”).

⁵⁸ ADA RECOMMENDATIONS

Mercury has a high vapor pressure and should be stored in a cool place. Baseboard heaters should be avoided since spills collect at the edges of rooms and the higher temperature at the baseboard will raise the mercury vapor level above the safe limit. Carpeting of operatories is not recommended to avoid absorption of any spilled mercury. A no-touch technic of handling mercury should be used. Water spray and high-volume evacuation should be used when removing old amalgam restorations or finishing new ones since heating releases some mercury vapor. A face mask should be used to avoid breathing amalgam dust.

R. CRAIG, W. O'BRIEN & J. POWERS, *supra* note 6, at 95. The ADA also recommends “a yearly mercury urinalysis of all dental office personnel.” D. SMITH & D. WILLIAMS, *supra* note 5, at 23 (footnote omitted). However, “urinary mercury levels appear to have little or no diagnostic significance, and are useful only as a

“moral” and a “legal” duty to protect dental personnel.⁵⁹ Because the primary danger in dental offices is “the atmospheric mercury vapor,”⁶⁰ the ADA presents an interesting paradox in its position on amalgam. The organization considers the mercury vapors which threaten dental personnel are “insignificant”.⁶¹

convenient means of assessing whether mercury exposure has occurred.” *Id.* at 26. See also, *Biocompatibility*, *supra* note 30, at 470 (“there appears to be little correlation between levels in urine, blood or hair, and toxic effects.”).

WARNING:”If mercury is improperly handled in the dental office, a health hazard may result from (1) systemic absorption of liquid mercury through the skin, (2) inhalation of mercury vapor, and (3) inhalation of airborne particles.”

R. CRAIG, W. O'BRIEN & J. POWERS, *supra* note 6, at 94. Recent surveys suggest that one out of ten dental offices in the U.S. may be in technical violation of the mercury exposure limit as recommended by the National Institute for Occupational Safety and Health (NIOSH) at 0.05 mg of mercury per cubic meter of air determined as a time-weighted average for an 8 hr. work day. D. SMITH & D. WILLIAMS, *supra* note 5, at 23 (footnotes omitted).

⁵⁹ D. SMITH & D. WILLIAMS, *supra* note 5, at 22.

Occupational exposure of personnel to potentially hazardous levels of mercury vapor is a very real concern to the practicing dentist in the U.S. because of (1) *moral responsibility* to protect self and employees from any source that may constitute a serious threat to health and welfare, and (2) *legal responsibility* as an employer under the Occupational Safety and Health Act [OSHA] of 1970. ... Currently, OSHA enforces a standard of 0.1 mg mercury per cubic meter of air in the work place.” *Id.* (emphasis added).

⁶⁰ *Id.* at 21. “Inhalation of mercury vapor in the atmosphere is the major exposure route in dental personnel....” *Id.* at 33.

⁶¹ See Choulos & Weiner, *supra* note 27, at 11.

With approximately 85 percent of the population in the United States carrying mercury and nickel amalgam fillings in their teeth, the American Dental Association... [is] very emphatic in precautioning dentists and technicians to protect *themselves* from known hazards of working with mercury compounds. Yet, this august body continues to recommend the use of mercury in the oral cavities of patients, including children.

Id. (emphasis in original). See also, H. HUGGINS & S. HUGGINS, *supra* note 4, at 11 (“the dental association is telling us that the only safe place to store amalgam is in the mouth.”).

Recent studies have found that substantial amounts of mercury vapor are released from dental amalgam after chewing gum for just ten minutes.⁶² Studies have also shown that mercury vapor can be released by “brushing the teeth with commercial toothpaste,”⁶³ “chewing food, drinking hot beverages, and smoking cigarettes.”⁶⁴ Therefore, mercury vapor is continually present.⁶⁵

Mercury Toxicity From Amalgams

Although amalgam subjects dental patients to dangerous mercury vapor,⁶⁶ when asked if mercury is poisonous, the ADA recommends that dentists answer patients in the following manner: “Not when used as amalgam.... [W]hen mercury is combined with other metals... it reacts with them to form a biologically *inactive substance*.”⁶⁷ The

⁶² *Dental ‘Silver’ Tooth Fillings*, *supra* note 4, at 2641 (footnote omitted) (mercury levels were six times higher than before gum chewing). *See also*, *Maternal-Fetal Distribution*, *supra* note 43, at R939 (“In humans, the continuous release of Hg vapor from dental amalgam tooth restorations is markedly increased for prolonged periods after chewing.”); *Mercury—An Element of Mystery*, *supra* note 40, at 1138 (“The vaporization of mercury is stimulated during chewing and for several minutes thereafter.”).

⁶³ *Dental ‘Silver’ Tooth Fillings*, *supra* note 21, at 2641 (footnote omitted).

⁶⁴ H. QUEEN, *supra* note 1, at 22–23. Another researcher concludes: “If the capacity of mercury vapors to inflict central nervous system injury is a proven fact, so, too, the capacity of lead fumes to deliver the metallic poison through inspired air is incontestable.” Ingalls, *supra* note 38, at 6 (1986) (citing Putman, *Quicksilver and Slow Death*, *Natl. Geographic* 507 (Oct. 1973)).

⁶⁵ *See infra* note 96.

⁶⁶ Choulos & Weiner, *supra* note 27, at 12 (“the growing concern is the possibility of immune suppression and other serious effects of mercury leaching from dental fillings.”).

⁶⁷ *Special Report*, *supra* note 3, at 395 (emphasis added). *See also*, INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4.

It is a fallacy that mercury is neutralized when it is combined with other components of silver dental amalgam.... Mercury is diluted by the other components of amalgam in what may be considered a solid solution. Although the vapor pressure of mercury is reduced, mercury vapor is still released.

ADA instructs its dentists not to inform patients that amalgam continuously releases mercury — even if patients inquire.⁶⁸ No governmental agency has established *safe* standards for mercury intake from dental amalgams. Some experts believe “there is no safe level of mercury exposure.”⁶⁹

The ADA investigated the possible affects of amalgam fillings in 1984 and assured the nation that, “[a]lthough there is no evidence of a health threat, we will pursue the question of safety until the matter is resolved to the satisfaction of the American people.”⁷⁰ The 1984 Workshop on The Safety and Biocompatibility of Metals in Dentistry concluded that mercury is released from amalgam fillings.⁷¹ Nevertheless, the ADA maintained that no health problems could result from such a small amount of exposure.⁷² When subsequent studies

Id. at 2 (quoting Dun, *Harmful Vapors in the Office: A Report of the Findings of the 1985 ODA/RCDS Survey of Mercury Vapor in Dental Offices in Ontario, Ontario Dentist* 37–38 (1988)).

⁶⁸ *Special Report*, *supra* note 3, at 395–96 (dentists are instructed to say, “no evidence exists that associates this minute amount of mercury vapor with any toxic effects.”). *See also*, Friedman, *supra* note 3. *But see infra* at 157 (research demonstrates that low doses of mercury have toxic effects).

⁶⁹ Lee, *supra* note 9 (citing mercury toxicity experts Thomas Clarkson of the University of Rochester Medical School and Lars Friberg of the Karolinska Institute in Stockholm, Sweden). *See* H. QUEEN, *supra* note 1, at 15 (“While acceptable limits are often quoted by the federal regulatory agencies and health agencies, mercury is a poison at any level....” (emphasis in original)). *See also*, Lee, *supra* note 9 (Michael Ziff, an Orlando dentist, stopped using amalgam about nine years ago and believes “[t]he ADA should stop the use of this material until it can prove amalgam is safe.”); INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 3 (“Toxicology experts maintain that there is no threshold level of mercury exposure which can be considered totally harmless.”).

⁷⁰ H. QUEEN, *supra* note 1, at 253 (quoting Edgar W. Mitchell, Ph.D., secretary to the ADA’s Council on Dental Therapeutics, *ADA News Release I: Experts to Review Safety of Metals in Dentistry* (Dec. 1983)).

⁷¹ H. QUEEN, *supra* note 1, at 253 (citing National INSTITUTE OF DENTAL RESEARCH, *Workshop: Biocompatibility of Metals in Dentistry*, 109 J.A.D.A. 469 (1984)).

surfaced linking amalgam fillings to several incurable diseases, the ADA denied all claims that amalgam could possibly be responsible⁷³ — while reassured those concerned that it would “continue” to do everything in its power to resolve any questions as to its safety.⁷⁴

In response to claims concerning amalgam hazards in 1987, the ADA boldly responded that such claims are unfounded,⁷⁵ “unsubstantiated, undocumented, and unproven.”⁷⁶ However, numerous studies performed since 1981, “demonstrate a positive correlation between dental amalgams and mercury levels in the human brain.”⁷⁷

Other countries have taken action to limit or prohibit the use of amalgam fillings. Two years ago, the Swedish government “recommended that dentists stop using amalgam to fill the teeth of

⁷² H. QUEEN, *supra* note 1, at 253 (author’s note) (“To my knowledge, no further research (funded by either the ADA or NIDR) has been stated, or even planned, as a result of this workshop.”).

⁷³ *Id.* at 254 (quoting John Stanford, Ph.D., biochemist and secretary to the ADA Council on Dental Materials, Instruments and Equipment, *ADA News Release I: Experts to Review Safety of Metals in Dentistry* (Dec. 1983) (“There is no evidence relating dental amalgam to... diseases and afflictions [such as multiple sclerosis & epileptic seizures]. To our knowledge, no cause-effect relationship has ever been established.”).

⁷⁴ *Id.* (quoting Edgar W. Mitchell, Ph.D., secretary to the ADA’s Council Dental Therapeutics, *ADA News Release I: Experts to Review Safety of Metals in Dentistry* (Dec. 1983) (“We wish the public to be as certain as we are that dental amalgam is safe, and we will pursue this matter until that certainty is assured.”).

⁷⁵ *Id.* (quoting ADA president, Dr. Donald E. Bentley, *ADA News Release II: ADA President Underscores Safety of Dental Fillings* (Dec. 1983)). See also, Peterson, *supra* note 27 (ADA spokesman Chuck Green said, “There is no reason for the public to be concerned and no reason to seek removal of fillings.”).

⁷⁶ H. QUEEN, *supra* note 1, at 256 (quoting Richard Asa, ADA Manager of Media Services for the ADA, telephone interview in the spring of 1987).

⁷⁷ Eggleston & Nylander, *supra* note 42, at 704 (footnotes omitted). (“The ADA bases its position on studies performed in 1957 by Frykholm, indicating there is little or no risk to the patient. ... However, Frykholm’s study did not address long-term accumulation of mercury on the brain tissue.”).

pregnant women.”⁷⁸ Since then, Swedish authorities determined to ban the use of all mercury, including its use in amalgam fillings, by 1991, have urged that its use in pregnant women cease immediately.⁷⁹ Viking Falk, division chief of the Swedish Social Welfare and Health Administration, said, “We now realize that we have made a mistake. This has caused people to suffer unnecessarily.”⁸⁰ The ADA “quickly regarded [this report] as ‘bogus[.]’”⁸¹ However, the Swedish ban was subjected to public hearings and subsequently upheld.⁸² In fact, in November, 1990, the Swedish government passed a law providing its citizens the opportunity to have their amalgam fillings removed under the national dental plan.⁸³ Also, legislation has been introduced in Germany to ban the use of amalgam.⁸⁴ In Japan, dentists have likewise sought to use alternatives to amalgam.⁸⁵

Current research demonstrating strong evidence of chronic mercury toxicity in patients with amalgam fillings has done little to persuade the

⁷⁸ Richards, *supra* note 56.

⁷⁹ 2 Dental & Health Facts 1 (Nov. 1989) (citing Atterstam, *Socialstyrelsen Stops Amalgam Use*, Svenska Dagbladet (May 20, 1987). See also, Eggleston & Nylander, *supra* note 42, at 706 (footnotes omitted).

(“The temporary high levels of mercury in the blood immediately following the removal and placement of dental amalgam has been documented.... The removal and insertion of dental amalgam for gravid patients, or women of child-bearing age with the possibility of pregnancy, should be avoided whenever practical.”).

See also, Peterson, *supra* note 27.

⁸⁰ Dental & Health Facts, *supra* note 79.

⁸¹ S. Res. 12, 16th Leg., 1989 Alaska 1st. Sess. (“Concept Paper”).

⁸² *Id.*

⁸³ 60 Minutes, *supra* note 4.

⁸⁴ *Id.* at 11 (re: Swedish laws) (“A total ban [in Germany] is expected within the year.”).

⁸⁵ Richards, *supra* note 56 (citing Nobumasa Imura, a professor at Kitasito University in Tokyo).

ADA to reevaluate its position. Some dentists have suggested that their patients consider changing their amalgam fillings and replace them with non-toxic materials, based on current research. The ADA has labeled the actions of these dentists “unethical,” stating that dentists engaging in this practice raise “a question of fraud or quackery in all but an exceedingly limited spectrum of cases.”⁸⁶ However, current research has prompted groups, such as the Environmental Dental Association (EDA), to call for a ban on any use of mercury in dental materials.⁸⁷ The EDA contends that using amalgam without informing the patient of associated risks and alternatives is “unethical.”⁸⁸ A summary of recent scientific findings, which follows, suggests that health threats from amalgam exist in laboratory animals and probably in humans.

Current Research

Researchers from the departments of medicine, pathology and physiology from the University of Calgary, Alberta, Canada, performed revealing experiments during 1989 and 1990 regarding the safety of amalgam fillings. Two studies examined the effects of amalgam fillings on sheep, while a third studied its effects on monkeys. The 1989 study

⁸⁶ The ADA has defined “quack” as “an ignorant or dishonest practitioner.” *What Can Be Done About Dental Quackery?*, 115 J.A.D.A. 679 (1987) (quoting WEBSTER’S MEDICAL DESK DICTIONARY). However, it is unclear whether ADA members or other pro-amalgam dentists who continue to use amalgam fillings and refuse to acknowledge research pertaining to the safety of amalgam are sufficiently “ignorant” under the ADA’s accepted definition. *But see* INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 9 (emphasis added) (“The ADA... is apparently suggesting that dentists deliberately violate their own code of ethics and withhold vital information from their patients and the public. *Such action cannot help but intentionally violate the patients right to full informed consent.*”); *infra* at 168.

⁸⁷ *Dental Ethics and Mercury*, Spotlight, Oct. 22, 1990, at 15, col. 1.

⁸⁸ *Id.* (EDA President Joyal Taylor, DDS: “Since no one knows just how little mercury it takes to cause permanent damage, as little exposure as possible [to] this powerful poison is the logical and moral course to take.”).

placed amalgam fillings into the mouth of a four year old ewe for 29 days.⁸⁹ At the end, mercury was absorbed in the lungs⁹⁰ (due to “continual breathing of the ‘intra-oral air’ having mercury vapor”), the stomach⁹¹ (through “the mixing of intra-oral Hg vapor, amalgam microparticles, and dissolved mercuric ions with saliva and food before swallowing”), the jaw⁹² (“some tissues in the jaw... and tooth root and surrounding bone”), “the brain[,] and several endocrine glands.”⁹³ The kidneys had high concentrations of mercury,⁹⁴ which disproves earlier theories that mercury is excreted.⁹⁵ The study concluded that, because about 8% of inhaled elemental mercury vapor is absorbed into the blood in humans, it immediately “becomes available for tissue retention.”⁹⁶ Since the study found problems resulting from mercury exposure so quickly, amalgam fillings “remain[ing] in human teeth for eight to ten years... would allow an extended opportunity for body tissues to be continuously exposed to Hg [mercury].”⁹⁷ The study concluded:

⁸⁹ *Dental ‘Silver’ Tooth Fillings, supra* note 4, at 2642.

⁹⁰ *Id.* at 2644.

⁹¹ *Id.*

⁹² *Id.*

⁹³ *Id.*

⁹⁴ *Id.* “The kidney and endocrine glands are known sites of autoimmune disorders, which brings into question the long-term implications of Hg [mercury] concentration in these tissues from dental amalgams....” *Id.* at 2645 (quoting Murray Vimy of University of Calgary). See Peterson, *supra* note 27 (“The average loss of kidney function [in the sheep] was 50%.”).

⁹⁵ *Dental ‘Silver’ Tooth Fillings, supra* note 21, at 2644. See also, *infra* notes 117 and 119.

⁹⁶ *Id.* (footnote omitted). See also, INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 3. “[The] continual release of mercury will inevitably result in measurable exposure from the 17,000 breaths that a person inhales daily. Once this mercury is inhaled 74% to 100% of the mercury is absorbed from the lung into the blood stream and distributed throughout the body.” *Id.* (citing Goldwater, Ladd & Jacobs, *Absorption and Excretion of Mercury in Man; VII Significance of Mercury in Blood*, 9 ARCH. ENV’T HEALTH 735 (1964)).

“dental amalgams can be a major source of chronic Hg [mercury] exposure.”⁹⁸

Another study, at the University of Calgary in 1990, investigated the affect of amalgam fillings on a fetus.⁹⁹ Five pregnant ewes had amalgam placed in their teeth at 112 days gestation. This study demonstrated that mercury from amalgam fillings appear in maternal and fetal blood and the amniotic fluid within two days after placement of the dental restorations.¹⁰⁰ The study concluded that amalgam also accumulates in maternal and fetal tissues.¹⁰¹ These results prompted the researchers to conclude: “Dental amalgam usage as a tooth restorative material in pregnant women and children should be reconsidered.”¹⁰² Mercury exposure is of particular concern in the developing fetus and in children due to their low body weight.¹⁰³

⁹⁷ *Dental ‘Silver’ Tooth Fillings*, *supra* note 4, at 2645.

⁹⁸ *Id.* (footnote omitted) (“Our laboratory findings in this investigation are at variance with the anecdotal opinion of the dental profession, which claims that amalgam tooth fillings are safe. *Experimental evidence in support of amalgam safety is at best tenuous.*” (emphasis added)). *See also*, Hahn, Kloiber, Leininger, Vimy & Lorscheider, *infra* note 115, at 3256.

⁹⁹ *Maternal-Fetal Distribution*, *supra* note 43, at R939.

¹⁰⁰ *Id.*

Highest concentrations of Hg from amalgam in the adult occurred in [the] kidney and liver, whereas in the fetus the highest amalgam Hg concentrations appeared in the liver and pituitary gland. The placenta progressively concentrated Hg as gestation advanced to term, and milk concentration of amalgam Hg postpartum provides a potential source of Hg exposure to the newborn. *Id.*

¹⁰¹ *Id.* A study being prepared for publication, sponsored in part by Sweden’s Karolinska Institute, demonstrates that mercury penetrates the placentas of mothers. The mercury accumulates in infant brain tissue. Peterson, *supra* note 27. “There is a transportation of fairly high concentrations of mercury from the mother to the brain of the fetus.... And that is a warning.” *Id.* (quoting Dr. Magnus Nylander of Stockholm).

¹⁰² *Maternal-Fetal Distribution*, *supra* note 43, at R939.

¹⁰³ INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 3. *See also*, *Dental Ethics and Mercury*, *supra* note 87. *But see* Peterson, *supra*

A study performed ten years ago concluded that pregnant women should avoid exposure to mercury.¹⁰⁴ Previous studies have also demonstrated that mercury exposure from amalgam can deteriorate the immune system.¹⁰⁵ Although the Calgary studies did not show whether kidney functions returned after removal of the amalgam, Fritz L. Lorscheider, who was involved in both of the Calgary studies, concluded: “[we] know that mercury is highly toxic and that it concentrates in certain parts of the human body. From the sheep, we know it can alter kidney function in animals. That should be enough to get it banned.”¹⁰⁶

The University of Calgary studies were the first to demonstrate that changes in body functions occur following the implantation of amalgam.¹⁰⁷ Shortly after publication, the findings were reported on the front page of the Chicago Tribune on August 15, 1990.¹⁰⁸ The article quoted a Food and Drug Administration (FDA) representative as saying, “In light of emerging scientific data, the FDA needs to re-examine the

note 27 (Former president of the American Academy of Pediatric Dentistry disagrees with findings suggesting amalgam can be harmful, especially to children, and continues to use amalgam with the following endorsement: “I want nothing but the best for the children I see.”).

¹⁰⁴ World Health Organization: Recommended Health-Based Limits on Occupational Exposure to Heavy Metals. Report of a WHO Study Group, 467 WHO Tech. Rep. Ser. 1 (1980) (“Exposure of women of child-bearing age to mercury vapor should be as low as possible because elemental mercury readily passes the placental barrier.”). See also, Macdonald, *Occupational Hazards in Dentistry*, 12 J. CALIF. DENT. A. 17 (1984).

¹⁰⁵ Eggleston & Nylander, *supra* note 42.

¹⁰⁶ Lee, *supra* note 9. See also, *Drilling for Danger?*, *supra* note 40 (Researcher Murray Vimy of the University of Calgary said that “Mercury ‘seriously compromises’ organ systems in test animals... and ‘should be banned immediately’”); Peterson, *supra* note 27 (Murray Vimy of the University of Calgary research team challenged the pro-amalgam dentistry world “to investigate thoroughly the possible ramifications of [amalgam’s] use in humans.”).

¹⁰⁷ Peterson, *supra* note 27.

¹⁰⁸ *Id.*

use of amalgam. It may be necessary to reclassify amalgam and take various regulatory actions.”¹⁰⁹ The FDA allowed the use of amalgam to continue in 1976 because the substance was already widely in use.¹¹⁰ Some believe the FDA’s decision to do so was largely because of the ADA’s influence within the FDA.¹¹¹ However, after the animal tests at Calgary, the FDA would probably not allow amalgam to be used if it were a new product.¹¹² Some Chicago dentists took exception to the Chicago Tribune’s decision to give the story so much prominence.¹¹³

¹⁰⁹ *Id.* (quoting Gregory Singleton, senior dental regulatory reviewer for the federal Food and Drug Administration). See also, Peterson, *supra* note 27 (the FDA may soon require manufacturers of amalgam to “provide safety and effectiveness data.”).

The FDA’s Dental Products Panel recommended on March 15, 1991 that, while it was confident that amalgam fillings pose no threat to most people, more research must be done to “allay the fears of the public.” *Panel Takes the Teeth out of Fears over Dental Fillings*, Deseret News, March 16, 1991, at A3, col. 6. Dr. Manville G. Duncanson, Jr., chair of the panel, stated that although “animal studies show significant mercury absorption from dental fillings..., no studies have been done in humans and there is no evidence that amalgam fillings cause disease.” *Id.*

¹¹⁰ Peterson, *supra* note 27. See also, *Dental Ethics and Mercury*, *supra* note 87; *60 Minutes*, *supra* note 4 (“The FDA remains confident in the value of amalgams in dental care. It says it could ban them, but it won’t do that until it is satisfied there is a health risk.”).

¹¹¹ *60 Minutes*, *supra* note 4.

[T]he FDA’s dental division has been platooned full of American Dental Association people. The entire committee is made up of people from dental institutions, practicing dentists and people from the dental industry who make the dental materials. There is virtually no medical input or basic science input for medicine on that committee. [Thus], anything the ADA wants they pretty much get through the FDA. *Id.* at 9. (quoting Dr. Murray Vimy).

¹¹² Peterson, *supra* note 27 (citing Murray Vimy of the University of Calgary).

¹¹³ See *Voice of the People: Baa, baa, baa*, Chicago Tribune, Aug. 29, 1990, section 1, at 15, col. 3 (“As a result of this alert journalism, I am confident that no dentist will ever again do a silver filling on a sheep.”). See also, *Voice of the People: Silver Fillings*, Chicago Tribune, Sept. 9, 1990, section 4, at 2, col. 3 (“Why then do you give so much exposure and implied credence in what happened to the kidneys of six sheep in Canada? ... Would you call a test on six sheep in Canada significant?”).

The ADA has been accused by anti-amalgam dentists of actively seeking to avoid problems of liability which might arise through any admissions.¹¹⁴

A more recent study completed by the University of Calgary found that monkey kidneys, like sheep kidneys, concentrated large amounts of mercury when given amalgam fillings.¹¹⁵ Another study of two adult monkeys at the University of Georgia, in cooperation with the University of Calgary, concluded that bacteria normally present in the digestive tracts of monkeys were disrupted.¹¹⁶ The normal bacteria were replaced by a strain of mercury-resistant bacteria that recycle the metal in the body instead of allowing the monkey to excrete it.¹¹⁷ Preliminary research in human subjects indicates that people with silver fillings also develop bacteria that can use mercury.¹¹⁸ One researcher from the University of Georgia study stated, "This may... explain why not all mercury entering the body is excreted and high levels are found in certain organs. ... It proves that mercury is 'bio-available' — something that dentists have been denying for years."¹¹⁹ However, the

¹¹⁴ Richards, *supra* note 56. See also, *infra* note 179.

¹¹⁵ Vimy, Boyd, Hopper & Lorscheider, *Glomerular Filtration Impairment By Mercury Released From Dental "Silver" Fillings In Sheep*, 33 *The Physiologist* A-94 (Abstracts) (Aug. 1990); Hahn, Kloiber, Leininger, Vimy & Lorscheider, *Whole-Body Imaging Of The Distribution Of Mercury Released From Dental Fillings Into Monkey Tissues*, 4 *FEDERATION AM. SOCIETIES FOR EXPERIMENTAL BIOLOGY* J. 3256 (1990) ("This study clearly demonstrates that the phenomenon of high Hg accumulation in body tissues after dental amalgam placement which we previously reported in sheep (footnotes omitted) is not unique to that species, and is readily demonstrable in primates as well." *Id.* at 3258-59).

¹¹⁶ See Summers, Wireman, Vimy & Lorscheider, *Increased Mercury Resistance In Monkey Gingival and Intestinal Bacterial Flora After Placement of Dental "Silver" Fillings*, 33 *The Physiologist* A-116 (Abstracts) (Aug. 1990) (mercury was found to attack the primate immune system) [hereinafter *Increased Mercury Resistance*]; see also, *60 Minutes*, *supra* note 4.

¹¹⁷ *Increased Mercury Resistance*, *supra* note 116 at A-116.

¹¹⁸ Lee, *supra* note 9.

ADA dismissed the above “animal studies as irrelevant to humans,”¹²⁰ although a monkey’s “dentition, diet, feeding regimen, and chewing pattern closely resemble those of humans.”¹²¹

The battle over use of amalgam appears to have become one of “medical science vs. dental opinion.”¹²² However, once the studies are duplicated and receive greater acceptance in the scientific world, David Eggleston of the University of Southern California School of Dentistry admits, “positions could change.”¹²³

Amalgam and the Environment

Dental amalgam is classified as a hazardous material in the work place by OSHA, and excess dental amalgam must be disposed of according to OSHA’s Material Safety Data Sheet.¹²⁴ However, the health threat of amalgam scraps may potentially reach far beyond the work place in the dental office. Although most of the industrial uses of mercury have been reduced, dental offices serve as a major source of mercury contamination in our environment. This occurs when dental personnel improperly dispose of scrap dental amalgam. For example, it can pollute ground and drinking water,¹²⁵ or vapors released through incineration can pollute the air.¹²⁶

¹¹⁹ *Id.* (quoting bacteriologist Anne Summers of the University of Georgia).

¹²⁰ *Drilling for Danger?*, *supra* note 40.

¹²¹ Hahn, Kloiber, Leininger, Vimy & Lorscheider, *supra* note 115, at 3256 (“The dental profession’s advocacy of silver amalgam as a stable tooth restorative material is not supported by these findings.”).

¹²² Peterson, *supra* note 27 (quoting Murray Vimy of the University of Calgary).

¹²³ Peterson, *supra* note 27.

¹²⁴ *OSHA to Begin Enforcing “Hazard” Rule*, 19 Am. Dental A. News 1 (Aug. 1, 1988).

¹²⁵ *Infra* notes 127 and 134.

¹²⁶ *See infra* note 150.

Pima County, Arizona Dentists Suspended

Recently, the Pima County (Arizona) Wastewater Management Department, in cooperation with the Environmental Protection Agency (EPA), determined that local dentists were illegally dumping mercury into treated sewer water.¹²⁷ Tucson experts discovered excess mercury in the Santa Cruz River, downstream from the county's two sewer treatment plants.¹²⁸ Officials traced the source to local dental offices, which were temporarily closed as a result.¹²⁹ As of October 1989, 71 of the reported 73 mercury violations in Pima County (Tucson), since 1985, were directly traced to dental offices.¹³⁰

The reason behind the strict Arizona environmental law lies in the delicate ecological system of the Santa Cruz River.¹³¹ However, local dentists maintained that the mercury must have come from other sources, and that amalgam poses no environmental threat. Richard Simoneaux, a Tucson dentist and Southern Arizona Dental Society President remarked, "There is mercury in the amalgam, but it's OK to put amalgam in your mouth and it's OK to put it in a landfill.... [W]e don't want to pollute the environment and we don't think what we are doing is wrong — we're dumping amalgam, not free mercury."¹³² The EPA does not agree.

EPA Takes Action in Connecticut

In 1988, a group of 58 New England dentists, the owners of a

¹²⁷ *County Says Dentists Are Dumping Excess Mercury*, *supra* note 25.

¹²⁸ *Id.*

¹²⁹ *Id.*

¹³⁰ *Id.*

¹³¹ *Id.* "Mercury, which can kill as it attacks the central nervous system of animals, 'accumulates in vertebrates.'" *Id.* (quoting Bruce Palmer of the Arizona Game & Fish Department).

¹³² *Id.*

chemical company, an “amalgam broker,” and two dental supply companies incurred liability under § 107 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA)¹³³ for improperly disposing of amalgam at two different waste sites.¹³⁴ An EPA settlement resulted in payment of \$69,812 — about 10% of the cleanup cost of \$710,000.¹³⁵

The U.S. filed suit,¹³⁶ after which the other defendants eventually settled.¹³⁷ The U.S. stated earlier in the pleadings that amalgam is an environmental hazard. In its complaint, the government averred that since “mercury, silver, co[p]per and zinc are listed as hazardous substances under CERCLA... [and] these elements make up dental amalgams, [then] *amalgam is itself a hazardous substance.*”¹³⁸

¹³³ 42 U.S.C. § 9607 (as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499, 100 Stat. 1613 (1988)).

¹³⁴ EPA, *Dentists Settle in Mercury Cleanup Case*, 19 Am. Dental A. News 1 (Aug. 15, 1988) (Both sites required the removal of twelve hundred ten (1,210) tons of mercury contaminated soil).

¹³⁵ *Id.* The dentists settled with the EPA pursuant to 122(h) of CERCLA, 42 U.S.C. § 9622(h) (1988).

¹³⁶ U.S. v. Eugene L. Bourdeaudhui, Elsie Bourdeaudhui, Edward Battle, Benco Dental Supply Co., Inc., Ott Dental Supply Co., and Smith-Holden, Inc., A. Levanthal & Sons, Inc., Civ. No. H-88-354 (AHN) (D. Conn. June 3, 1988), Dept. of Justice file No. 90-11-2-362, EPA Region I Site Numbers 74 & 76 [hereinafter Bourdeaudhui].

¹³⁷ *Id.* (Consent Decree, signed July 28, 1989); 1989 EPA Consent LEXIS 14, Civ. No. H-88-354 (AHN) (D. Conn. 1988) (Consent Decree), Dept. of Justice file No. 90-11-2-362, EPA Region I Site Numbers 74 & 76 (LEXIS, Envirm library, Cases file).

¹³⁸ Bourdeaudhui, *supra* note 136 (complaint at 4) (citing 42 U.S.C. §§ 9602 & 42 U.S.C. 9601(14)) (1988) (emphasis added). For purposes of § 107 of CERCLA, amalgam is a mercury compound, a zinc compound, a silver compound and a copper compound. *Id.* See 40 C.F.R. § 302.4 at 930, 944, 955, 962 (1987). The U.S. also noted that mercury is a hazardous air pollutant under § 112 of the Clean Air Act, 42 U.S.C. § 7412 (1988), 40 C.F.R. § 61.01 (1990), and a toxic pollutant under § 307(a) of the Clean Water Act of 1977, 33 U.S.C. § 1317(a) (1988) and 40 C.F.R. § 401.15 (1990). Bourdeaudhui, *supra* note 136 (complaint at 4) (citing 33 U.S.C. §

Before the consent decree, the ADA filed to appear, introduce evidence and make oral argument as *amicus curiae* on November 7, 1988.¹³⁹ The ADA hoped to have some influence on “whether dental amalgam is a regulated material under the provisions of CERCLA, and whether dental amalgam can be classified as a ‘hazardous substance’ pursuant to CERCLA.”¹⁴⁰ After the settlement, the ADA confidently declared that the government’s position and the subsequent outcome had no affect on “[w]hether amalgam is safe for use in the mouth.”¹⁴¹ One of the dental supply defendants circulated a letter following the settlement, interpreting the result as an official declaration by the government that amalgam was a hazardous substance.¹⁴² In an effort to

1317(a) (1988), 40 C.F.R. § 401.15 (1990) (also listing mercury and compounds, silver and compounds, copper and compounds, zinc and compounds)). The EPA has reasoned that “any substance that contains a listed hazardous substance is itself a hazardous substance.” *Court OKs ADA Appearance in Amalgam Case*, 20 Am. Dental A. News 1 (Jan. 16, 1989).

¹³⁹ *Bourdeaudhui supra* note 136 (Motion to Appear, Introduce Evidence, File Brief and Make Oral Argument as Amicus Curiae). The ADA wrote:

The issues involved in this action are of paramount importance to the members of the ADA as well to the general public since their resolution will have a vital impact on the general public and on the manner in which the members may practice their profession in the United States, in that the handling and recycling of dental amalgam is being challenged in the United States. Dental amalgam is the primary restorative material utilized by dentists for the restoration of the teeth of patients.

Id. at 4. As part of its effort to establish the safety of amalgam fillings, the ADA reiterated its resolve that “Dental amalgam has been safely used in the United States for over 150 years and dates back several centuries in other countries.” *Id.*

¹⁴⁰ *Id.* See also, *Court OKs ADA Appearance in Amalgam Case, supra* note 138 (“In appearing as a friend of the court, the ADA is doing what it can to ensure that its position on the safety of scrap amalgam is made clear.”).

¹⁴¹ *EPA, Dentists Settle in Mercury Cleanup Case, supra* note 134 (quoting Mary K. Logan, ADA associate general counsel). The ADA feared the case could set off a legal declaration that dental amalgam could be declared a hazardous substance by a federal court, as it clearly was by the EPA. “In a worst case scenario, scrap amalgam could be declared an environmental hazard, but that is the extent of it.” *Id.*

¹⁴² *Court OKs ADA Appearance in Amalgam Case, supra* note 138.

squelch this *misunderstanding*, the ADA responded that, although the EPA considers amalgam to be hazardous, “[t]here has not been a decision by any court that finds dental amalgam to be a hazardous substance.”¹⁴³ The ADA’s interpretation of the law appears to be in direct conflict with the government’s in the pleadings and consent decree.¹⁴⁴ As for the circulated letter, the ADA fears it “has tripped an alarm that may be difficult to silence.”¹⁴⁵

The ADA appears to be in a precarious position. While its stated purpose, as set forth in *Bourdeaudhui*,¹⁴⁶ is “to advance the health of the public and to promote the art and science of dentistry...,”¹⁴⁷ it incorrectly represents that dental amalgam has been “proven to be safe and effective...”¹⁴⁸ Scientific research over the past several years is at odds with the ADA’s latter representation. The ADA’s refusal to seriously consider scientific findings regarding the hazards of amalgam fillings appears to be in conflict with its purpose as an organization.¹⁴⁹ If amalgam fillings are hazardous to the public when dumped or otherwise disposed of, then they potentially threaten the community at large.¹⁵⁰ In order to remain a credible organization, the ADA should

¹⁴³ *Id.* (quoting Kenneth D. Walma, ADA legal affairs director, “That’s not a federal court talking,” said Mr. Walma. “That’s the EPA; the court has said nothing of the sort.”).

¹⁴⁴ *See, supra* note 137.

¹⁴⁵ *Court OKs ADA Appearance in Amalgam Case, supra* note 138.

¹⁴⁶ *See supra* note 137.

¹⁴⁷ *Id.* (Motion to Appear, Introduce Evidence, File Brief and Make Oral Argument as Amicus Curiae at 2).

¹⁴⁸ *Id.*

¹⁴⁹ *Supra* note 147.

¹⁵⁰ A new environmental hazard was recently identified in Britain as a result of the effects of burial funerals to cremation. Dr. Allan Mills, of Leicester University, says that poisonous mercury vapor is being released into the air from the dental fillings of the cremated. *Mills, Mercury and Crematorium Chimneys*, *Nature* (London) 615

welcome scientific research involving amalgam and other dental materials, and be willing to change its position when the health and welfare of dental patients and the public are compromised by dental procedures or dentists.¹⁵¹

Do Patients Have the Right to Know?

It would be prudent for the ADA, at this juncture, to reconsider its position. It should consider that many dental patients, once properly informed, might prefer some other substance as a filling material. For example, a physician has a duty to disclose to the patient the contents of a prescription and any potential side effects.¹⁵² Affirmative efforts are now being directed toward requiring dentists using amalgam to obtain informed consent from their patients. However, the ADA opposes any legislation designed to accomplish this.¹⁵³

Traditionally, the law of informed consent “insists that an individual’s wishes be honored under all but a very few circumstances.”¹⁵⁴ Justice Cardozo recognized that “Every human being

(Aug. 16, 1990).

¹⁵¹ One of the ADA’s “signs” as to “how to spot a quack” is whether a dentist “supports claims with articles published in obscure, pseudoscientific journals or the public media.” *How to Spot a Quack*, 115 J.A.D.A. 681 (1987). However, no definition of “pseudoscientific” was provided.

¹⁵² See *infra* note 157.

¹⁵³ The ADA’s position is simple: Since there is no risk involved, informed consent is unnecessary. See *60 Minutes*, *supra* note 4, at 9–10 (Dr. Heber Simmons, ADA spokesman).

¹⁵⁴ Kotler, *Utility, Autonomy and Motive: A Descriptive Model of the Development of Tort Doctrine*, 58 U. CINN. L. REV. 1231, 1260 (1990) (citing *Schloendorff v. Society of New York Hosp.*, 211 N.Y. 125, 105 N.E 92 (1914) (Cardozo, J.)). See also, Note, *The Doctrine of Informed Consent Applied to Psychotherapy*, 72 GEO. L.J. 1637, 1640 (1984) [hereinafter *Doctrine*] (footnotes omitted) (“The doctrine of informed consent is the means by which individuals are informed of, and may assert their preferences for, alternative forms of available medical treatment.”).

of adult years and sound mind has a right to determine what shall be done with his own body...."¹⁵⁵ Doctors were held to have a duty to inform patients in *Salgo v. Leland Stanford, Jr., Univ. Bd. of Trustees*,¹⁵⁶ where the California Court of Appeals found that a physician has a duty to disclose "any facts which are necessary to form the basis of an intelligent consent by the patient to the proposed treatment."¹⁵⁷ Providing sufficient information to allow patients the opportunity for making *informed* decisions is one of the specific duties placed upon doctors as part of their responsibilities in providing professional care of their patients.¹⁵⁸ This duty arises primarily from the doctor-patient relationship, because this "one-to-one relationship" facilitates "personal consultation and discussion."¹⁵⁹

Neither the ADA nor any American dentists are currently under a specific duty to inform patients of potential hazards of amalgam fillings, or to offer patients an option of available alternative materials. No affirmative duty will exist without state or federal legislation or without a resolution from a judicial proceeding. Generally, a duty usually exists where "reasonable persons would recognize it and agree that it exists."¹⁶⁰ Because the ADA "produces most of the dental health

¹⁵⁵ Kotler, *supra* 154, at 1260 (quoting *Schloendorff v. Society of New York Hosp.*, 211 N.Y. 125, 129-30, 105 N.E. 92, 93 (1914) (Cardozo, J.)).

¹⁵⁶ 154 Cal. App. 2d 560, 573-75, 317 P.2d 170, 181 (Dist. Ct. App. 1957).

¹⁵⁷ *Id.*

¹⁵⁸ Shultz, *From Informed Consent to Patient Choice: A New Protected Interest*, 95 YALE L.J. 219, 226-27 (1985) (footnote omitted).

¹⁵⁹ Kotler, *supra* note 154, at 1252 (quoting Shultz, *From Informed Consent to Patient Choice: A New Protected Interest*, 95 YALE L.J. 219, 280 (1985)).

Doctors are universally conceded to be fiduciaries; as such they have special duties to serve their clients' interests. Patients have been redefining their interests in the direction of more active participation in decision making. In the wake of such redefinition, the nature of fiduciary obligation must also change to stress more advising and less deciding.

Id. at 279 (footnotes omitted).

education material in the United States...,"¹⁶¹ and steadfastly refuses to acknowledge the dangers of mercury exposure through amalgam fillings, related health hazards may continue to go largely unnoticed. The ADA's present posture in defense of mercury in dentistry has disastrous implications. While insisting that this "very serviceable, low-cost restorative material should [be made] available to the public[.]"¹⁶² the ADA fails to acknowledge the importance of providing information to patients about the dangers of amalgam. The public should be informed by dentists of the possible dangers associated with amalgam, and provided the opportunity to select other available materials. If the cost of dental treatment is of prime importance, then the patient should have the benefit of weighing the *low-cost* benefits of amalgam against potential hazards associated with chronic mercury exposure. Once a patient knows the risks, perhaps a more expensive substance would become more desirable.

Often, litigation of this kind arises from a doctor's failure to disclose *material* information to the patient.¹⁶³ Courts presume that people do not desire to be harmed or incur the risk of being harmed.¹⁶⁴ This presumption requires the doctor to demonstrate that the patient was informed of and consented to the risk.¹⁶⁵ In order to succeed in a suit

¹⁶⁰ W. KEETON, R. KEETON, D. DOBBS & D. OWEN, PROSSER AND KEETON ON THE LAW OF TORTS (5th ed. 1984) 359 (footnotes omitted) (for example, dentists could be held liable for studies of which they are aware or those which, by reasonable diligence, should be aware). "The evidence is here, and [the public] should say that if it's not reasonably safe... [it should not be put into a] child's mouth." *60 Minutes*, *supra* note 4, at 10 (quoting Dr. Alfred Zamm, allergist & dermatologist).

¹⁶¹ *Bourdeaudhui*, *supra* note 136 (Motion to Appear, Introduce Evidence, File Brief and Make Oral Argument as Amicus Curiae at 2).

¹⁶² Peterson, *supra* note 27 (quoting ADA President R. Malcom Overbey).

¹⁶³ Shultz, *supra* note 158, at 226-27 (footnote omitted).

¹⁶⁴ Kotler, *supra* note 154, at 1252.

¹⁶⁵ *Id.*

for informed consent based on negligence, the plaintiff must establish that a duty to disclose exists.¹⁶⁶ Once a duty is established, a clear nexus between causation and the resulting harm must be shown.¹⁶⁷ While research may provide enough evidence for a victim of mercury toxicity from amalgam fillings to demonstrate potential hazards, the causation element poses the biggest obstacle for the plaintiff. Absent a statute, expert testimony is necessary in order to establish a duty and then to show that the nondisclosure resulted in the harm under negligence doctrine.¹⁶⁸

Most states use an objective standard of causation in such cases.¹⁶⁹ However, jurisdictions differ as to who may establish the standard. The majority rule compels a doctor “to disclose facts which a reasonable medical practitioner in a similar community and of the same school of medical thought would have disclosed to his patient regarding the proposed treatment.”¹⁷⁰ This standard requires the plaintiff to demonstrate the necessity of disclosure through expert testimony.¹⁷¹

One minority approach views the nondisclosure from the patient’s point of view. In the decision making process, based on what the doctor knew or should have known about the patient’s position, courts using this approach weigh whether a reasonable person under similar

¹⁶⁶ See *supra* note 159.

¹⁶⁷ *Doctrine, supra* note 154 at 1642. See Twerski & Cohen, *Informed Decision Making and the Law of Torts: The Myth of Justiciable Causation*, 1988 U. ILL. L.R. 607 (1988). See also, Choulos & Weiner, *supra* note 27. “The proof of proximate may be difficult, but in cases with clearly manifested injuries it is not impossible if expert testimony is up to standard on causation.” *Id.* at 15.

¹⁶⁸ Shultz, *supra* note 158, at 226–27 (footnote omitted).

¹⁶⁹ Comment, *Informed Consent: Patient’s Right to Comprehend*, 27 How. L.J. 975, 978 (1984) [hereinafter *Informed Consent*] (quoting *Karp v. Cooley*, 493 F.2d 408 (5th Cir. 1974), *cert. den.*, 419 U.S. 845 (1974) (majority view)). See also, Shultz, *supra* note 158, at 248 (footnote omitted).

¹⁷⁰ *Informed Consent, supra* note 169, at 978.

¹⁷¹ *Id.* at 982 (footnote omitted).

circumstances would have been likely to attach significance to the information provided.¹⁷² This latter standard does not require expert testimony, but leaves “the court to look only at what the reasonable person deems to be material in making an informed decision.”¹⁷³ A noted trend has been to follow the minority view, which adheres to the rule that “the duty to disclose should be measured by the patient’s need for information rather than by the standards of the medical profession.”¹⁷⁴

Dentists who continue to use amalgam, despite scientific data raising questions as to its safety, may argue that the patient needs no informed consent because “the procedure is simple and the danger remote and commonly appreciated as remote.”¹⁷⁵ However, the plaintiff may dispute this defense with expert testimony.

A suit brought on grounds of products liability would be difficult since the patient never sees and never handles the amalgam. Therefore, no labels with warnings to patients would be effective.¹⁷⁶ However, the FDA may soon reclassify amalgam “so that sometime in the future

¹⁷² *Id.* at 981 (footnotes omitted). *See also*, Shultz, *supra* note 158, at 226–27 (footnote omitted). (This standard requires the patient to establish that the nondisclosed information would not only have induced him, but any reasonable patient to withhold consent).

¹⁷³ *Informed Consent*, *supra* note 169, at 982 (footnote omitted).

¹⁷⁴ *Id.* at 982–83 (footnotes omitted).

¹⁷⁵ *Id.* at (citing *Salis v. U.S.*, 522 F. Supp. 989 (M.D. Pa. 1981)). *See supra* note 50.

¹⁷⁶ *See* Comment, *The Drug Manufacturer’s Duty to Warn — To Whom Does It Extend?*, 13 FLA. ST. U. L. REV. 135, 156 (1985) [hereinafter *Drug Manufacturer’s Duty* (footnote omitted)] (“In order for a product warning to be effective, the following criteria must be met: (1) the warning must be received; (2) the warning must be understood; and (3) the individual must act in accordance with the warning.”). *See also*, *Dental Ethics and Mercury*, *supra* note 87 (after recently banning the use of mercury recently in all interior latex paint products, the EPA now requires all latex exterior paint be clearly labeled as to its mercury content).

manufacturers of these particular products would have to provide safety and effectiveness data.”¹⁷⁷ Still, the dental patient is wholly reliant on the dentist to provide information and facts relating to inherent risks and other alternatives.¹⁷⁸

*Class Action Suit Against ADA*¹⁷⁹

How will the courts determine whether a dentist, or an organization, has acted reasonably? Is the dentist who strictly adheres to the doctrine of the ADA reasonable? What about the dentist who concludes from available research that amalgams present a significant risk for patients? For him, being reasonable may result in harassment by the ADA and loss of licensure to practice, as determined by his peers on the state licensing board. A federal court will likely decide this issue in the near future. On September 20, 1990, a class action suit (hereinafter *Kennedy*) was filed in federal court.¹⁸⁰ Forty anti-amalgam dentists have charged the ADA with fraud for continuing to claim that amalgam fillings are safe.¹⁸¹ The *Kennedy* action also alleges that the ADA has harassed the plaintiff dentists and attacked their professional reputations as a direct result of the plaintiffs’ efforts to expose hazards of amalgam fillings.¹⁸² The plaintiffs further charge the ADA with continuing to deceive the American public with assurances about amalgam fillings, despite vast scientific evidence, “because they feared the embarrassment

¹⁷⁷ Peterson, *supra* note 27.

¹⁷⁸ *Drug Manufacturer’s Duty*, *supra* note 176, at 156 (footnote omitted) (suggesting that since patients rarely receive proper warnings from doctors that a direct manufacturer-to-patient to warn in lay language might be a better way to inform patients). See also, *Dental Ethics and Mercury*, *supra* note 87 (the EDA contends dentists who fail to inform patients of mercury-laden fillings are acting unethically).

¹⁷⁹ David Kennedy, D.D.S., et al. v. American Dental Association, Civil Action No. 1-90 Civ. 1692 (N.D. Ohio 1990).

¹⁸⁰ *Id.* at 2 (complaint).

¹⁸¹ *Id.*

¹⁸² *Id.* at 4–7.

and liability of being proven wrong, and because they feared that admission of their misrepresentations would result in a public relations disaster for themselves.”¹⁸³ The plaintiffs in *Kennedy* are seeking compensatory as well as punitive damages, an injunction enjoining the ADA from discriminating or otherwise “intimidating” the plaintiffs, together with an order requiring the ADA “to correct their wrongdoings.”¹⁸⁴

One attorney writes: “[t]he most expeditious way to bring about change is to resort to the courts for punitive damages in certain cases that involve suppression or destruction of evidence, or fraud by manufacturers on the public or in the medical profession.”¹⁸⁵ However, several groups are taking the legislative route to change, proposing laws requiring informed consent.

Legislative Efforts to a Solution

The EDA has called for a ban on the use of mercury in dental fillings and is actively promoting informed consent legislation in several states.¹⁸⁶ Colorado may emerge as the leader in strengthening rights of dental patients. This year, new legislation has been introduced imposing a specific duty on dentists to provide informed consent to their patients before placing dental amalgams in their teeth. The proposed legislation would impose strict liability on dentists who fail to obtain informed consent from dental patients.¹⁸⁷ In addition, the proposed legislation

¹⁸³ *Id.* at 12.

¹⁸⁴ *Id.* at 12–13.

¹⁸⁵ Choulos & Weiner, *supra* note 27, at 13. “The prospect of punitive damages makes a potential offender take notice, particularly when the measure is a portion of corporate profits and has made corporate executives vulnerable to criticism from stockholders who face reduced dividends.” *Id.* at 13–14.

¹⁸⁶ *Dental Ethics and Mercury*, *supra* note 87.

¹⁸⁷ H.R.J. Res. 1001, 57th Leg., 1990 Colo. 1st Sess. (Proposed 1990 amendment to 12-35-103 COLO. REV. STAT § 5 (1985 Repl. Vol.)) [hereinafter H.R.J. Res. 1001].

has sought to relieve dentists of any liability to the state dental board for recommending the removal of amalgam fillings in the interest of the patients' health.¹⁸⁸ Arguably, the existence of a health hazard should be brought to the attention of patients through informed consent. Patients need to know about the availability of safer alternative materials, despite higher costs and alleged inferior quality.¹⁸⁹ Inasmuch as patients must accept the consequences of the fillings placed in their teeth, the proposed legislation in Colorado would leave the decision to the patient, not the dentist.

Commentary supporting the proposed amendments suggests that dentists should be under the same obligations as other Colorado health

(1.7) "Informed consent" means written consent given by a patient prior to any dental procedure or treatment which involves the placement or implant of mercury amalgam or any other dental prosthetic containing mercury, and which is obtained after the patient is sufficiently informed as to the procedures or treatment to be used and all associated risks which a reasonable patient would consider significant in making a decision of whether to undergo the procedure or treatment, including any special risks involved of which the dentist knows or should reasonably know.

(2)... the use of amalgam or any other dental prosthetic containing mercury in the preparation and implant of dental fillings is expressly prohibited where prior written informed consent from the patient is not obtained.... A dentist shall be strictly liable for any injury which results from the placement of mercury amalgam into a patient where written informed consent is not obtained prior thereto.

Id. (emphasis added).

¹⁸⁸ *Id.*

(2)... No dentist shall be sanctioned, reprimanded, punished or otherwise prohibited from practicing dentistry by any entity or organization where the dentist has determined, within his or her professional judgment, that the removal and replacement of a mercury amalgam filling is reasonably necessary to restore or protect the patient's health and safety, and where the dentist proceeds to remove and replace such filling after making this determination....

Id. See also, *Consent and Authorization*, H.R.J. Res. 1001, 57th Leg., 1990 Colo. 1st Sess.

¹⁸⁹ See *supra* note 29.

providers who perform treatment or procedures which expose the patient to a significant risk.¹⁹⁰ Proponents of the Colorado legislation reason that “[b]ecause the potential harm is great, and minimal effort is needed to inform patients of this potential harm, it would be reasonable for dentists to provide this information to their patients before using amalgam.”¹⁹¹ In addition, advocates admonish state leaders that, at a minimum, this legislation will protect “those persons who are more susceptible to or affected by toxic poisons.”¹⁹² Specifically, the proposed statute would require dentists to inform patients that mercury is in amalgam fillings, the mercury can have toxic effects, alternative materials are available and the patient has the right to choose an alternative material.¹⁹³ Previous Colorado legislation in this area has

¹⁹⁰ *Supra* note 187 (Commentary to proposed 1990 amendment to 12-35-103 COLO. REV. STAT § 5 (1985 Repl. Vol.) at 1).

Within the dental profession, studies have provided substantial scientific evidence that dental amalgam containing mercury can endanger the health and safety of patients who receive amalgam fillings.... At present, dental patients are not typically informed of the potential risks which exist when mercury amalgam is used for dental fillings. The proposed Act seeks to assure the health and safety of all dental patients by requiring dentists to give their patients basic information regarding the risks involved when mercury amalgam is used.... [Disclosures as to the potential risks of mercury amalgam] would undoubtedly be greatly appreciated by the patients, and further strengthen the trust and confidence that the patient has in their dentist.

Id.

¹⁹¹ *Id.*

¹⁹² *Id.*

¹⁹³ H.R.J. Res. 1001, *supra* note 187.

WHEREAS it is a common dental practice in the state to use an amalgam of materials for dental fillings; and

WHEREAS this dental amalgam is thought by most persons to be made only of silver, but its composition is actually 50 percent mercury; and

WHEREAS some studies have shown that toxic mercury vapors can leak from the fillings into the patient's blood system and lead to mercury poisoning, particularly in chemically sensitive or allergic

failed because representatives of the Colorado Dental Association, like the ADA, have said they do not believe silver fillings are a health threat.¹⁹⁴ The ADA has labeled such legislation as “A wolf in legislative clothing.”¹⁹⁵

In Alaska, State Senate majority leader Pat Rodey reported that enough evidence exists to establish “reasonable doubt” as to the safe use of dental amalgam.¹⁹⁶ He therefore introduced a senate resolution, similar to the Colorado proposal, which would require informed consent from dental patients before the use of amalgam fillings in patients.¹⁹⁷ The Alaska Department of Health and Social Services advised in a “Concept Paper” in January, 1989, “persons who have had a large number of amalgam fillings, who have experienced symptoms commensurate with chronic low level mercury exposure and who have tried traditional treatments may wish to consider replacement

persons; and

WHEREAS dental patients should have the right to choose which materials are used for their dental fillings, but they often lack basic information from the dentist that would help them make an informed choice;

RESOLVED... dentists will inform their patients that:

- a. mercury is contained in most dental filling material;
- b. mercury in fillings can have toxic effects on some persons;
- c. there are alternative materials that could be used for dental fillings that could have other effects on the person; and
- d. they have a right to insist that an alternative material be used.

Id.

¹⁹⁴ *Dentist Says Silver Fillings Bad*, UPI, Jun. 8, 1983 (AM cycle).

¹⁹⁵ *A Wolf in Legislative Clothing*, 120 J.A.D.A. 397 (1990) (specifically referring to proposed legislation in Alaska).

¹⁹⁶ S. Res. 12, 16th Leg., 1989 Alaska 1st Sess.; see also, *60 Minutes*, supra note 4. “When I measured mercury coming off of fillings, that was ‘reasonable doubt’ in my mind.” *Id.* at 3 (quoting Dr. Murray Vimy). “There’s a lot of things we don’t know, but I do know that it’s not safe to put something in somebody’s mouth that has a question.” *Id.* at 7 (quoting Dr. Alfred Zann).

¹⁹⁷ S. Res. 12, 16th Leg., 1989 Alaska 1st Sess.

therapy.”¹⁹⁸ The proposed Alaska legislation did not pass as introduced initially,¹⁹⁹ but is being reintroduced again this year.

Last year, the Illinois House of Representatives adopted a House Resolution which requested that ²⁰⁰

the Illinois Department of Public Health review the studies that have examined the health risks of mercury in dental fillings and report to the General Assembly by March 1, 1990, its finding about such risks as well as its recommendations for providing a means by which dental patients may be informed of the findings and of the alternatives to mercury content in fillings when seeking dental treatment.

¹⁹⁸ *Id.*

¹⁹⁹ *A Wolf in Legislative Clothing*, *supra* note 195 (specifically referring to proposed legislation in Alaska).

²⁰⁰ H.R. Res. 1084, 86th Leg., 1989 Ill. 1st Sess. (Offered by Rep. Cowlishaw; Adopted on November, 1, 1989. Signed Michael J. Madigan, Speaker of the House and John F. O'Brien, Clerk of the House); reprinted in 6 Bio-Probe Newsletter 3 (Jan. 1990).

WHEREAS, It is a common dental practice in Illinois to use an amalgam of materials for dental fillings; and

WHEREAS, This dental amalgam, thought by the public to be made only of silver, is actually 50% mercury; and

WHEREAS, Studies have shown that toxic mercury vapors can leak from fillings into the blood system and cause serious health problems, particularly in persons with allergies or chemical sensitivities; and

WHEREAS, Dental patients often lack information that would enable them to avoid having mercury used for their fillings; therefore be it

RESOLVED, BY THE HOUSE OF REPRESENTATIVES OF THE EIGHTY-SIXTH GENERAL ASSEMBLY OF THE STATE OF ILLINOIS, that this body hereby requests that the Illinois Department of Public Health review the studies that have examined the health risks of mercury in dental fillings and report to the General Assembly by March 1, 1990, its finding about such risks as well as its recommendations for providing a means by which dental patients may be informed of the findings and of the alternatives to mercury content in fillings when seeking dental treatment; and be it further

RESOLVED, That a copy of this preamble and resolution be presented to the Director of the Illinois Department of Public Health.

The resolution was referred to the committee on assignment. No study was performed, and the bill died in committee. However, it will likely reappear in future sessions. North Carolina is another state which has considered legislation structured to provide dental patients with information about amalgam fillings.²⁰¹

The legislative process is often slow and “replete with economic and political considerations and often falls wide of the mark.”²⁰² Over the past decade, the ADA has postured itself to fight and discredit scientific research, rather than seek a cooperative venture with fellow scientists to resolve the matter in good faith.²⁰³ It is difficult to understand why the ADA does not favor informed consent legislation, since “Empirical evidence suggests that even when undesirable medical outcomes occur, the greater the degree to which the patient participates and is informed, the less likely she is to file a malpractice claim.”²⁰⁴ By endorsing informed consent, however, the ADA would have to alter its position on amalgam fillings, and would give credence to advocates opposing the use of amalgam materials.²⁰⁵ The ADA’s position that amalgam is safe

²⁰¹ *A Wolf in Legislative Clothing*, *supra* note 195 (referring to Alaska and North Carolina).

²⁰² Choulos & Weiner, *supra* note 27, at 13.

²⁰³ *See Drilling for Danger?*, *supra* note 40 (“Over the last 10 years, researchers have shown that mercury escapes from fillings and winds up in body tissues”).

²⁰⁴ Shultz, *supra* note 158, at 296 (footnote omitted).

²⁰⁵ While the ADA claims that dental amalgam is safe and effective, it also “believes that dentists should choose the best possible restorative material for each patient on an individual basis. The professional judgment of the dentist and the desires of the patient should be the foundation on which that choice is based.” *Special Report*, *supra* note 3, at 398. *But see* INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4, at 9 (suggesting that the ADA Principals of Ethics and Code of Professional Conduct are in conflict because they specifically disapprove of informing patients of the dangers of amalgam fillings, while placing a duty on dentists to report investigations leading to public health threats); *60 Minutes*, *supra* note 4, at 6 (Dr. Murray Vimy says the effect of the ADA’s position that informing patients of the dangers of amalgam is unethical infringes upon “the Constitutional rights of dentists and the rights of patients. [Patients] no longer have

based on 150 years of use is weak at best.²⁰⁶ The ADA has not produced scientific data which demonstrates the safety of amalgam fillings. In so doing, it has arguably failed in its duty to protect the public, as well as its own membership, from personal harm due to amalgam usage.²⁰⁷

The ADA may fear the flood gates of litigation will burst when the American people have all the necessary information about the potential harmful effects of mercury in amalgam. Intense litigation often follows when the public discovers it has been unnecessarily exposed to toxic substances.²⁰⁸

Historically numerous common products were thought to be safe; for example[,] asbestos, lead, and DDT. In each case the scientific concerns were immediately discounted by the industry responsible for the production or use of the material and often the assertions of safety were initially supported by the responsible government agencies. After a period of time as the evidence became overwhelming and legal liability impossible to ignore, they were regulated or withdrawn from the market. Each of these products demonstrated pathology after a latency period of chronic low dose exposure[,] as does mercury.²⁰⁹

freedom of choice and [dentists] no longer have freedom of expression.”); *supra* note 86.

²⁰⁶ *Supra* note 29.

²⁰⁷ *See supra* note 147.

²⁰⁸ H. QUEEN, *supra* note 1, at 24.

In the U.S., because of the legal aspect, dental authorities who today must set guidelines of acceptable dental protocol may be reluctant to speak out against the use of mercury when such action is warranted. They may fear that dentists who have followed their previous guidelines will become liable.... *An extension of this concern may also affect research. Whatever progress is made in getting closer to the truth would most likely be met with a great deal of resistance.*

Id. (emphasis added).

²⁰⁹ INTERNATIONAL ACADEMY OF ORAL MEDICINE AND TOXICOLOGY, *supra* note 4 at 6.

Perhaps the *Kennedy*²¹⁰ case will provide swifter resolve to the amalgam issue and result in adequate information concerning the risks of amalgam fillings being disseminated to dental patients. Freedom of choice means patients must receive the information necessary to allow the best possible opportunity to make an informed decision as to what dental procedures or materials will be used.²¹¹ This should no longer be a decision reserved for the dentist's sole discretion.

Conclusion

One author of a dental text advocates the use of amalgam fillings based on a *risk/benefit* analysis, because "the benefit from the treatment far outweighs any side effects from operative procedures and dental materials."²¹² However, with so many alternative materials available, this *risk/benefit* approach makes little sense. Since the ADA's declarations of the safety of amalgam fillings is based on tradition and remains unsubstantiated by research, dentists should reassess their legal and ethical positions. With respect to recent scientific findings about amalgam fillings, dentists can no longer expect credible support from the ADA, and should perform due diligence in obtaining knowledge and information on this subject.²¹³ While the FDA anticipates regulatory changes based on recent research, one reporter writes: "Until then, add amalgam fillings to the list of risks Americans must *decide* whether or not to bear."²¹⁴ However, no rights to make such an informed decision

²¹⁰ *Supra* note 179.

²¹¹ Kotler, *supra* note 155, at 1260 (citing *Schloendorff v. Society of New York Hosp.*, 211 N.Y. 125, 105 N.E. 92 (1914) (Cardozo, J.)).

²¹² I. MjÖR, *supra* note 17, at 24 (because "individual case reports often prevail as evidence... the problem should be dealt with on an individual basis rather than by prohibiting the use of a serviceable dental material.").

²¹³ See F. Royal, *supra* note 47 at 210.

²¹⁴ *Drilling for Danger ?*, *supra* note 40 (emphasis added); see *supra* note 27.

are currently afforded to individuals in this country by law.

Legal implications for dentists using the amalgam fillings are mounting. Evidence of amalgam toxicity and the availability of safer alternative materials, arguably, substantially increases the liability of the ADA and pro-amalgam dentists. One attorney has predicted that mass tort litigation from amalgam poisonings will soon become a “major courtroom event.”²¹⁵ The class action suit in *Kennedy*²¹⁶ may only be the tip of the litigation iceberg. Depending on the outcome of this case, “the mass litigation which will follow may well exceed other mass toxic tort cases....”²¹⁷ The evidence available suggests, “the mercury amalgam issue is an internal Love Canal waiting to be exposed.”²¹⁸ If this is correct, then the ADA, its members and other pro-amalgam dentists may soon have an opportunity to defend their position in the courts. Ultimately, it may take federal legislation to save traditional dentistry from financial ruin.²¹⁹



²¹⁵ Choulos & Weiner, *supra* note 27 at 14.

²¹⁶ *Supra* note 179.

²¹⁷ Choulos & Weiner, *supra* note 27 at 14.

²¹⁸ *Id.* at 15.

²¹⁹ Editor's note: Readers who are personally concerned about this problem should see *The Mercury in Your Mouth*, 56 CONSUMER REPORTS 316 (1991). — published just before this issue went to press.