The background of the cover features a photograph of three people in professional attire. In the foreground, a man in a white lab coat and blue shirt sits in a brown dental chair, looking directly at the camera. Behind him, a man in a dark suit and a woman in a grey blazer stand. The large yellow 'CDA' logo is superimposed over the top half of the image.

CDA

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Pollution Prevention
Proposition 65
Politics

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External Influences

Alan L. Felsenfeld, DDS



OF THE CALIFORNIA DENTAL ASSOCIATION

Journal

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A Perennial Controversy

JACK F. CONLEY, DDS

In February of this year, the California Dental Association issued a document titled “Major Issues Facing Dentistry in 2001.” Eleven concerns made that heralded watch list. Monitoring of managed care, dental student debt relief, licensure by credential, and a Denti-Cal fee increase were among the high-visibility issues.

It costs the dental profession that has not yet been the beneficiary of a strong scientific study that conclusively ends speculation about its safety. Or, looked at from a different perspective, the dental profession has yet to benefit from a study that shows an alternative material that offers the same cost benefits and satisfactory long-term restorative durability as amalgam and couples these qualities with unquestioned safety.

Yes, dental amalgam is back in the spotlight. However, it never really slipped completely off the radar screen since the last major challenge to its efficacy during the unforgettable “60 Minutes” episode of late 1990. It has been an issue for more than a century; and, as a result, it may not make any Top 10 list unless there is a major event to trigger it, such as the one a decade ago.

However, amalgam has continued to be a frequent topic of controversy for a combination of reasons. First, there has been the matter of Proposition 65 citations that have referred to amalgam and other dental treatment materials as having “chemicals” that can cause cancer, birth defects, or other reproductive harm. Then there is the matter of mercury in wastewater in San Francisco Bay and other less well-known locations in the California environment. Estimates (not verified as accurate) by publicly owned treatment works in San Francisco and Seattle suggest that the dental office contribution to the amount of mercury in wastewater treated in their plants is between 6 and 14 percent.

Finally, there is organized, ongoing activity by groups such as the Americans Against Mercury coalition that keep the suspicions about negative health effects caused by mercury and mercury vapor foremost in the minds of the media and the public.

At the time of this writing, we believe that two of the above reasons have recently brought the questions surrounding dental amalgam back into focus. If concerns involving amalgam continue to surface, as they have recently, it should become one of the problems to make the end-of-the-year list of major issues of 2001. It is unfortunate that dentistry is continually faced with a recurring public relations dilemma because of the unsubstantiated concerns about the effects on the health of the public of the mercury in this restorative.

The first activity to focus on amalgam this year was the Proposition 65 enforcement, which has been citing dentists with practices of 10 or more employees for not posting a warning about the potential harmful effects on health by mercury in amalgam. In late April, Americans Against Mercury announced legal actions against individual dentists and dental manufacturers, among others, in a first round of class action lawsuits and other measures seeking “the outright and immediate ban of the use of mercury in the U.S.” according to a report in the *ADA News*. The initial suit, which was filed in Maryland by five dentists and seven patients, was featured in a *Wall Street Journal* article on May 10, positioning it as a problem with national significance. According to the WSJ, the plaintiffs argued that regulators such as dental boards “use control of dental licenses to punish or threaten punishment of dentists who criticize mercury amalgam,” an action that violates the dentists’ First Amendment rights.”

While not confirmed, the *ADA News* believed at press time that the ADA was

named as a defendant in one of these lawsuits, brought by an individual against her dentist for alleged malpractice. The WSJ article explores some of the history of the “Amalgam Wars,” as it puts it, and presents a report of a patient who allegedly developed mercury poisoning from a new filling containing mercury. It also offers comments from a chemist who published several studies using rat and human brain samples showing that brain tissue exposed to mercury develops the same biochemical defects seen in Alzheimer’s disease. It goes on to print a response attributed to the American Dental Association regarding mercury from amalgam restoration as a factor in the development of Alzheimer’s disease: “The ADA responds by pointing to a study published in its journal that concluded that mercury in fillings ‘*does not appear*’ to be a factor in the development of Alzheimer’s disease.”

In a further attack on the credibility of the ADA study, the article goes on to claim that one of the study’s authors “is wary of that conclusion.”

The same chemist is quoted in *ADA News* as being critical of a lack of National Institutes of Health funding for studies that look at the “potential neurotoxicity of mercury routinely placed into human contact by medicine and dentistry.”

On a positive note, the *ADA News* report stated that the National Institute of Dental and Craniofacial Research is supporting two large clinical trials on the health effects of dental amalgam. Unfortunately, this information is not included in the WSJ report. The *ADA NEWS* also mentions other ongoing studies and reported that the chair of the House Committee on Government Reform on April 25 called for a study on the safety of low-level medical and dental uses of mercury, including amalgam, by the National Institutes of Health.

Both *ADA Online* and *CDA Online* are replete with position statements reviewing the scientific literature on amalgam, which collectively seem to conclude that amalgam continues to be a safe and effective

restorative material. Nonetheless, it seems that the problem facing the profession is that the science included in these position statements is not convincing to the media in view of the barrage of criticism and the unsupported “scientific” claims of the organized anti-amalgam forces. Statements such as the recent one attributed to ADA by the *WSJ*, “the mercury in amalgam *does not appear* to be a factor in Alzheimer’s disease,” are positive in supporting continued use of amalgam, yet seem to lack the killer instinct that might successfully quiet the critics.

Similar statements include:

- The 1991 Food and Drug Administration panel statement that found “no valid data to demonstrate clinical harm to patients from amalgams or that having them removed would prevent adverse health effects or reverse the course of existing diseases”;
- The 1993 U.S. Public Health Service report that stated “there is no health reason not to use amalgam, except in the extremely rare case of the patient who is allergic to a component of amalgam,” and;
- The 1997 FDI World Dental Federation and World Health Organization consensus statement on dental amalgam, “No controlled studies have been published demonstrating systemic adverse effects from amalgam restorations.”

Unfortunately, the statements seem defensive and leave open the possibility that a controlled study might be brought forward that demonstrates some adverse systemic effects from the mercury in amalgam. Critics inside and outside of dentistry continue to feed the suggestion that the ADA, or research supported by the organized profession, is hiding something negative about the health effects of amalgam. Perhaps the current NIDCR clinical trials or other ongoing studies will be able to deliver a conclusive finding in this controversy. Such a finding would have been a welcome solution during most of the past decade.

The other solution to this dilemma

would be the development of a substitute material that is as cost-effective, easy to manipulate, and durable as amalgam that could be shown to be safe. With each passing day, the likelihood that such a miracle material can be developed fades just a bit. Our optimism took a major hit when composite resin showed up at the head of the Proposition 65 list of materials (alongside amalgam) used in dental treatment that “contain chemicals known to the state of California to cause cancer, birth defects, or other reproductive harm.”

Dentistry and dental research may succeed in finding more nearly perfect materials to restore the damaged dentition, but in the consumer-oriented world of today, even the best and safest new materials will unlikely be able to outrun the controversy that is created by well-intended but misguided public initiatives such as Proposition 65 or interest groups that either ignore or question science in advancing their narrow objectives. CDA leadership has received reports that there are rumblings of a growing bias in California in consumer-affairs and legislative circles against the continuing use of dental amalgam (mercury) in dentistry. By the time our remarks are disseminated, we anticipate that significant new events in this controversy may have arisen.

Whether amalgam remains or can or will be replaced by a “safe” new material with similar characteristics, we live in a world of controversy that tends to be influenced more by anecdotal reports and perceived vulnerabilities about dental restorative materials than on available science. It is regrettable that in recent decades, science has not been able to provide dentistry new and more conclusive evidence about our available restoratives more rapidly. As a result, the profession individually and collectively may be placed in the unenviable position of defending its credibility in all questions concerning the continued use of a significant number of essential dental restoratives that have been classified as potentially harmful to the health of the patients we are entrusted to treat.

Proverbs Shine Light on Ergonomics

By DEBRA BELT

Sometimes old proverbs say it best, especially when discussing ergonomic issues.

For example, "An ounce of prevention is worth a pound of cure."

At least that's what Labor Secretary Elaine Chao is advocating, although not exactly in those proverbial words. In the first major announcement by the Bush administration since Clinton-era ergonomic standards were struck down in March, Chao outlined the principles that will guide the formulation of new ergonomic rules. There is no timeline for when new federal standards will emerge. However, first on Chao's list of principles is prevention.

"The Department of Labor's goal will be to prevent ergonomic injuries rather than rely on command-and-control enforcement," Chao says. "The workforce and economy require a new approach to safety based on cooperation and prevention rather than the antiquated, adversarial approach of years past."

For California dentists, a little Yiddish wisdom is handy here: "A wise man hears one word and understands two."

Those two words would be "prevention now," even though OSHA rules are not currently requiring it. When the federal ergonomic rules were repealed earlier this year, dental offices in California were bound to comply only with less-stringent state standards, which basically focus on ergonomic issues after they have become a problem, i.e., when a repetitive motion injury has occurred to more than one employee with similar work duties in a 12-month period.

As the saying goes, "a stitch in time saves nine."

A little attention to ergonomic issues now could help prevent worker's compensation costs and loss of employee work time in the future. According to the Bureau of Labor Statistics, there were 582,300 musculoskeletal disorders that resulted in employees missing time from

work in 1999, the most recent year for which statistics are available. Such disorders are caused by the cumulative trauma of repetitive tasks.

Zenith, a workers' compensation insurance provider for CDA members, reports that one-third of all claims are hand, wrist, or upper extremity cumulative trauma injuries. Cumulative trauma in upper extremities accounts for half of workers' compensation costs, according to Dave Strong, MPH, CIH, of Zenith's safety and health department.

As the old English proverb says, "protect the goose that lays the golden eggs."

In a labor market where hygienists and assistants are difficult to find, a little protective action in the form of ergonomics can go a long way. Ergonomics basically means the study of people, the objects they use, and the environment in which they function. Experts in the field have looked closely at tasks related to dentistry and developed suggested preventive strategies. The following measures come from Gayle Macdonald, RDH, PhD, who has been studying ergonomic issues for the past 15 years in relation to her teaching duties at the University of Southern California School of Dentistry.

- Provide adequate workspace and unobstructed access to both sides of the patient.
- If possible, rotate employees from one job to another. This is sometimes impossible in a dental office, but if it can be done, it could reduce the possibility of musculoskeletal disorders from developing. Dentists may also want to consider how many days per week employees are working.
- Provide adjustable furniture that will minimize leaning, twisting, and reaching and will allow employees, as much as possible, to keep their bodies in a neutral position.
- Maintain a straight back and keep the weight of the head on top of the spinal column when working. Proper use of a mouth mirror may be helpful as will

looking through the lower half of the visionary field.

- Use neutral hand and body postures whenever possible.
- Use sharp, lightweight instruments with large-diameter handles whenever possible to reduce required force and number of repetitions.
- Use properly fitted gloves. Injuries may be exacerbated by the use of ambidextrous gloves or wearing gloves that are too small. Wearing an ambidextrous glove forces the hand to work against an unnatural position.
- Alternate tasks so that employees are not doing all the heavy work (i.e., quadrant presurgical scaling appointments) in a row.
- Allow time for brief breaks between patients.

Other preventive measures include providing education about symptoms of musculoskeletal disorders such as tingling, pain, or burning sensations; decreased sensation to touch; numbness; weakness; cramping; and stiffness. Most musculoskeletal disorders are correctable if treated early.

As the French would say, "It is not enough to run, one must start on time."

Online Resources for Ergonomic Information

A list of OSHA employer responsibilities: <http://www.osha.gov/as/opa/worker/employer-responsibility.html>
Ergonomic standards and solutions for specific industries: <http://www.osha-slc.gov/SLTC/ergonomics/index.html>
Statements from the Bush administration concerning ergonomics: <http://www.osha-slc.gov/ergonomics-standard/index.html>
For more proverbial wisdom: <http://www.corsinet.com/braincandy/proverb.html>

Second-Hand Smoke May Cause Caries in Children

Children whose parents smoke are more likely to develop dental caries, according to a study from the University of Rochester's Strong Children's Research Center.

Forty-seven percent of the children involved in the study had caries in deciduous teeth, and 26 percent had caries in permanent teeth. Second-hand smoke was most associated with caries in deciduous teeth, likely because children who have not entered school are more dependent on their parents, spending more time with them and increasing their exposure if the parents smoke.

"This study should serve as a sobering wake-up call to parents who still don't see the danger in smoking around their children," says pediatrician Andrew Aligne, MD, the study's lead author and an assistant professor of general pediatrics at the University of Rochester. "This study indicates that second-hand smoke accounts for a significant proportion of cavities in children."

The well-established association of caries with low socioeconomic status has not yet been explained, but Aligne theorized that second-hand smoke might be a risk factor. Young children who are poor are still particularly vulnerable to caries despite the overall decrease in the entire population during the past few decades.

Aligné and his colleagues analyzed data from the third National Health and Nutritional Examination Survey, which provided a nationally representative sample of 3,873 children.

"This relationship between cavities and second-hand smoking persisted after we controlled for many variables, including age, sex, race, region, dentist's visits, nutritional status, and blood lead levels," Aligne says. There was also a dose-response effect: The higher the exposure to smoke, the more carious lesions the children had.

The children in the study had dental examinations and a blood test measur-

Tea Fights Cavities, Reduces Plaque

A group of researchers from the University of Illinois College of Dentistry believe that black tea and its components benefit oral health by interfering with bacteria that cause dental caries and periodontal disease.

"In recent years, many symposia and publications have focused on the health effects of green teas. Earlier studies by Japanese scientists have suggested that consumption of green tea lead to reduction of dental cavities in humans," says Dr. Christina Wu, the principle investigator of the study. "However less attention has been focused on black tea, the more popular drink in the Western countries; and worldwide 80 percent of the tea consumed is black tea."

The study was presented at the American Society of Microbiology General Meeting.

Wu and her colleagues found that compounds in black tea were capable of killing or suppressing growth and acid production of caries-causing bacteria in dental plaque. Black tea also affects the bacterial enzyme glucosyltransferase, which is responsible for converting sugars into the material that plaque uses to adhere to teeth. In addition, certain plaque bacteria, upon exposure to black tea, lost their ability to form the clumpy aggregates with other bacteria in plaque, thereby reducing the total mass of the dental plaque.

One of Wu's study found that when volunteers rinsed with black tea for 30 seconds five times at three-minute intervals, plaque bacteria stopped growing and producing acid. This research supports an earlier Swedish study that found rinsing the mouth with black tea significantly reduced plaque build-up.

"It is our belief of these researchers that the intake of black tea can be significant to improve oral health of the general public," Wu says. "If sequenced properly between meals and normal oral hygiene, a reduction in dental caries may be possible. Drinking tea may have added oral health benefits by controlling through 'prevention' the most prevalent diseases of mankind, mainly caries and periodontal disease."

ing their cotinine levels. An objective, quantitative marker of tobacco-smoke exposure, cotinine can reveal whether someone is a smoker or is often subjected to second-hand

smoke. When people are exposed to tobacco smoke, they absorb nicotine into the body. In order to excrete the nicotine, the body turns it into cotinine.

Aligné suggests that dentist use the findings to bolster their anti-tobacco efforts with patients.

"If a child has a cavity, the dentist should explain to parents that smoking may be the cause," Aligne adds.

Click with Care: Problems Abound on Web Health Pages

Finding answers to important health questions using Internet search engines and simple search terms is difficult at best. And while the information consumers do find on Web sites is generally accurate, it is usually incomplete and hard for many readers to understand, according to a report in the May 23 issue of the Journal of the American Medical Association.

Recent surveys indicate that almost 100 million Americans go online in search of health information; 70 percent of them say that what they find influences treatment decisions.

Reunion Classes Donate \$2 Million to UOP

University of the Pacific School of Dentistry alumni celebrating reunions recently gave UOP \$2 million.

During the alumni association's recognition luncheon earlier this year, representatives from the reunion classes of 1951, 1956, 1966, 1976, 1991, and 1996 presented class gifts. The largest gift, \$1,320,000, came from the Class of 1966.

The 10-year reunion class also reached a milestone with its \$400,000 gift to the dental school. It is the largest gift given by a 10-year reunion class in the history of the UOP School of Dentistry.

The study, commissioned by the California HealthCare Foundation, is the most comprehensive evaluation to date of the quality, accessibility, and readability of the data in a vast, rapidly expanding e-health universe that numbers millions of Web pages and thousands of sites. The study's research focused on information about four medical conditions: breast cancer, childhood asthma, depression, and obesity.

"We know that the Internet is revolutionizing the availability of health information for consumers. The study suggests that there are lots of good things going on, and also lots of room for improvement," says Mark D. Smith, MD, MBA, president and CEO of the California HealthCare Foundation.

The study found that answers to important health questions are often incomplete. Working with nationally recognized clinical experts and patient advocates, the researchers established the basic elements of what consumers should know about each of the four conditions studied and compared those with the information on 25 Web sites.

Among the findings:

- On average, about one-third of those clinical elements were not covered at all by the sites.
- Although the accuracy of information presented was fairly high, many of the sites contained contradictory information.
- The research showed that consumers

may encounter a lot of irrelevant information when using search engines and simple search terms.

Advice for Patients Surfing the Web

- They should allow ample time to search for answers to their questions.
- They should be aware that a single site will probably not provide a comprehensive picture of what they need to know about a condition. As many as four to six sites must often be visited.
- They should discuss information they find on the Internet with their health care providers before they use it to make a treatment decision.

Oral, Tongue Cancer Rates Rise Among Young Americans

A new research study asserts that even though the overall incidence of head and neck cancers has remained stable, young Americans are being diagnosed with higher rates of oral and tongue cancer.

The study, *Head and Neck Cancer Incidence Trends in Young Americans, 1973-1997, With a Special Analysis for Tongue Cancer*, was presented at the 2001 spring meeting of the American Head and Neck Society.

The goal of the research was to update and confirm the changes in incidence of young adult oral tongue cancer, as well as

other head and neck cancers, using a large cancer surveillance database in the United States. Data for the analysis were obtained from the Surveillance, Epidemiology, and End Results Program Public-Use CD-ROM (1973-1997), released April 2000.

The SEER program registered 63,409 head and neck cancer (oral and pharynx) patients from 1973 to 1997. Of these, 3,339 patients were less than 40 years old. From the 1973-1984 period to the 1985-1997 period, the overall incidence of head and neck cancer was stable.

In regard to the number of cases and observed incidence rates, researchers noted a slight decrease in 1985-1997 in ages 40 and older. In contrast, however, the number of patients with head and neck cancer increased among young Americans less than 40 years old. The increase seemed to be mainly caused by tongue cancer.

The increase in tongue cancer in individuals born after 1938 and its association with improved survival suggest the emergence of a distinct disease process independent of tobacco and alcohol use. This disease process is apparent in white, but not black, populations and is of uncertain cause.

Many reports suggest that head and neck cancer, particularly oral tongue cancer, is increasing among young adults internationally.

Factors that may account for oral cancer in the young adults remain unknown. Suspected causes include smokeless tobacco, various forms of drug abuse, virus, as well as host susceptibility factors. However no clear evidence exists to support the significance of any single determinant, including the role of tobacco.

Honors

David M. Perry, DDS, was recently elected president of the California Society of Pediatric Dentists. Perry is also the pediatric dentistry representative to CDA's Interdisciplinary Affairs Committee.

External Influences on Dentistry

ALAN L. FELSENFELD, DDS

CONTRIBUTING AUTHOR

Alan L. Felsenfeld, DDS, is an associate professor of oral surgery at the University of California at Los Angeles School of Dentistry. He is also the chairman of CDA's Council on Dental Research and Developments.

Recently, I had the opportunity to interview a young man who was applying for admission to the University of California at Los Angeles School of Dentistry. His father and one of his brothers were physicians, and two other brothers were somewhere in the medical education process. When I asked him why he desired dentistry rather than medicine as his career, his reply was surprising. The student indicated that he felt that in the dental profession there would be “fewer people looking over his shoulder” as he worked. I felt this was an interesting reply, but I did not want to discourage him by saying that he was in for a rude awakening when he completed dental school.

Most of us entered dentistry because we envisioned ourselves practicing in private offices with complete control over our environments, our patient care, and the management of our businesses. While this may have been true 50 years ago, today everyone who is actively practicing dentistry is well aware of the myriad of agencies -- governmental and private -- that influence our professional lives. The CDA Council on Dental Research and Developments is charged with monitoring some of these external influences and with recommending and carrying out

activities to ensure these outside elements enhance and improve the profession.

This issue of the *Journal of the California Dental Association* is intended to heighten awareness of the regulations and circumstances that may appear to burden us in the practice of our profession. The following well-respected authors have contributed informational articles that are intended to educate the membership as to some of the areas that we need to focus upon to ease the onus of the oversight of outside groups.

Cathy Mudge contributes discussion of the legislative pathway for regulatory issues from CDA's Government Relations Office. She delineates the agencies that potentially affect dental practice and the forces that empower them to regulate or legislate. The role of the media and public organizations is also considered.

An issue that has grabbed the attention of California dentists this year is Proposition 65. This is a state-only law that many members have grappled to understand because our knowledge and experience tells us the law doesn't make sense. CDA General Counsel Linda Seifert provides answers to some of the questions frequently asked of CDA in recent months. Her article, however, is not the last you will hear on this topic as legal negotiations

continue among the concerned parties.

Bill Johnson, an environmental engineer, and Teresa Pichay, coordinator of the Council on Dental Research and Developments, present a paper on the relative pollution of wastewater by amalgam and mercury from dental offices. The problem is defined, and the regulatory concerns are elaborated. Suggestions are provided that potentially will ease for practitioners the transition to wastewater regulatory compliance.

Eve Cuny presents a general discussion of the impact of regulatory agencies on dental practice as well as resources that are available to help us. One organization that is growing in influence and recognition as a valued resource to the practitioner is the Organization for Safety and Asepsis Procedures. As a member of this organization's board of directors, Ms. Cuny is particularly qualified to discuss its role in the practice of dentistry.

Finally, one of the more difficult areas of influence on dental practice is the ethical aspect. This reflects an individual interpretation of what is correct or acceptable for the patient or dental practice. While this aspect of dental care is not regulated, broad community values do influence it. Bruce Peltier, who is a recognized and respected authority on this subject, discusses ethical considerations for the dental profession.

It would be nice to think that dentistry is not under the watchful eyes of outside entities. It would be nice but naive. We do not practice in a vacuum, and we must accept the regulatory and legislative influences on our daily lives. Inspections of dental offices can be made by numerous agencies, including but not limited to Cal/OSHA, the Department of Health Services, the Dental Board of California, and numerous insurance companies. Local governmental bodies that deal with environmental issues such as waste or fire and safety hazards may also evaluate our offices.

Are we as dentists unaware of the regulatory requirements for practices?

No. Can we as dentists improve the environment in which we practice to protect ourselves, our staffs, and the community? Certainly.

So what about this poor student who interviewed for admission to UCLA and did not want to have anyone looking over his shoulder as he practiced? Well, it is clear that he will learn soon that his chosen profession is not the ideal environment he envisioned. And he also will become aware of and learn to manage the regulations and other external influences that affect his practice. Be assured that the California Dental Association is constantly monitoring the regulatory and legislative influences on our profession and working to make sure their approaches are pragmatic.

How and Why Politics Affect Dentistry

CATHY MUDGE

ABSTRACT Dental practices are under scrutiny every day. The dynamics of the public, the media, the lawmakers, the regulators, and other special interest groups create endless possibilities for influence over a practice and continue to challenge a dentist's ability to provide quality dental care to patients. This article describes examples of laws and regulations affecting dentistry and the impetus for them, whether real or perceived.

AUTHOR

Cathy Mudge is a legislative advocate in CDA's Government Relations Office. She provides legislative lobbying and political advocacy for the association.

Politics and government affect a dentist's ability to practice dentistry. Whether the issue is infection control, employee safety, labor laws, hazardous waste disposal, medical waste disposal, specimen handling, water and air quality, Proposition 65 disclosure requirements, the use of anesthesia, licensing and scope of practice issues for dentists and dental auxiliaries, professional liability insurance, third-party payer policies and reimbursement rates, or government programs such as Denti-Cal and Healthy Families, it can affect a dentist's ability to practice quality dentistry in California.

California has a Democrat-controlled administration, Senate, and Assembly. The United States has a slight Republican edge with a Republican president and

a Republican-dominated House of Representatives. Local governments, although nonpartisan, often lean one way or the other -- liberal or conservative. Government agencies most often reflect the politics of the politicians in the majority. These dynamics change at minimum with every election cycle, and the laws created during each administration are the direct result of many factors.

A short list of some of the federal, state, and local government entities that can affect a dentist's ability to practice is shown in **TABLE 1**.

Government mandates come about for any number of reasons. Voluntary programs can sometimes be used to stave off more formal government solutions. For example, best management practices are being tested in San Francisco to reduce

Table 1. Government Entities That Can Affect the Practice of Dentistry

Federal Government	
	Congress
	Environmental Protection Agency
	Department of Health and Human Services
	Internal Revenue Service
	Occupational Safety and Health Administration
State Government	
	Governor
	Attorney general
	State senators and assemblymembers
	California Environmental Protection Agency, including the Department of Toxic Substance Control, Water Resources Control Board, and the Office of Environmental Health Hazard Assessment
	California Occupational Safety and Health Administration
	Employment Development Department
	Department of Consumer Affairs, including the Dental Board of California
	Department of Industrial Relations
	Department of Health Services
	Office of Environmental Health Assessment
	Franchise Tax Board
Local Government	
	City councils
	County boards of supervisors
	Publicly owned treatment works
	Certified unified program agencies
	Water agencies

mercury levels in office effluents. If it is determined that those best management practices can be effective in reducing mercury levels, and dental offices consistently follow them, there may be an opportunity to forego more onerous legislative remedies. Dentists' efforts in this area may very well affect the outcome of this issue. In many cases, however, although voluntary programs may be

able to address some of the concerns, lawmakers believe it is necessary to legislate to solve a problem.

Some examples of laws and regulations affecting dentistry are described here, along with the impetus for them, whether real or perceived.

The federal Occupational Safety and Health Administration recently adopted the final version of some controversial

ergonomic standards (29 CFR Section 1910.900). The Bush administration has, however, postponed implementation of these regulations; and it has not indicated what its final recommendations or regulations will be. Changes to OSHA are often initiated by large labor unions that believe new laws must be passed in order to protect their members and employees in general.

Cal-OSHA implemented regulations requiring the use of safety needles following legislation that resulted from a union representing health care workers concerned about the transmission of AIDS, hepatitis, and other diseases contracted through needlestick injuries. In hospitals and emergency rooms across the nation, the danger of exposure is very real to many of the health care workers providing care. At the request of the union, coupled with an effective media campaign, a San Francisco legislator carried a bill to require the use of safety needles. Although not a target of the legislation, dental offices are health care facilities and were included. CDA's efforts during the implementation of regulations resulted in a temporary exemption from the requirement pending proven safety results from the use of safety needles in dentistry.

The media has a very significant effect on legislation. In 1997, a 4-year-old boy in a dental clinic in Orange County died following an overdose of chloral hydrate. Following investigations by the Dental Board of California, significant media attention, and the cries of concerned citizens, legislation was proposed in an attempt to prevent such an event from happening in the future. Although it may be debated whether there was a need for additional regulation, the political reality of the situation demanded action. The Dental Board was proposing a significant and onerous solution; and following discussions with CDA, dentists, and legislators, a much more reasonable approach resulted. There continues to be interest in this area, vis-à-vis children's safety, in the legislative arena.

Several years ago, some children took a specimen storage box from outside of a clinical lab, broke it open, and played with the contents (blood and lab specimens). The public outrage that a child could gain access to these specimens translated into broad-based legislation placing many constraints on the ability of medical and dental offices to store and transport specimens. Again, CDA and its members voiced their concerns, and the resulting legislation took into consideration the operational and logistical requirements of the dentist.

Local water agencies must meet wastewater pollution limits set by the federal and state Environmental Protection Agencies. As a result, many have had to address the level of mercury in water prior to entering a wastewater treatment plant. In one instance, EPA levies against a county that does not meet the minimum standard a fine of \$10,000 per day, which is a significant burden on financially strapped counties. In other cases, the overall level of mercury in the local water supply could prevent further business expansion in a community by limiting planning commission approvals until limits are under control. And although dentistry may not be the primary producer of mercury in wastewater, the profession is an easily isolated and regulated one from the local agency's perspective. Because the entities regulating wastewater throughout the state are not uniform in their standards, the profession must deal with regional and local government agencies to develop solutions.

Generally, consumer organizations exist to protect the public. Some organizations, however, may believe -- based on their own personal experience, anecdotal evidence, or poorly designed and implemented "scientific" studies -- that a product is dangerous. Their approach is often to raise a certain level of concern and doubt in the public -- enough to make lawmakers aware of the concern their constituents have on an issue. A combination of grass-roots activities and public relations campaigns is usually used to help move the consumer

group's cause forward. Several years ago, a television news magazine segment on the dangers of bacteria in dental unit waterlines caused undue concern among dental patients. Legislation was proposed in California, and an educational effort by CDA postponed any activities in this area.

The Dental Board is responsible for the safety of dental consumers. The board is involved in licensure, educational standards, advertising, and discipline, among other issues. They determine who should practice dentistry in California, how often they must take continuing education courses, and whom should be disciplined and how. Its decisions are heard far and wide; and reactions come from the public, the media, legislators, consumer advocates, dentists, and auxiliaries.

Dental insurance company policies and reimbursement rates affect the practice of dentistry. Legislators want plans to cover as many Californians as possible but at rates that families and/or their employers can afford. State lawmakers and government officials want to see a balance of quality coverage and cost, adequate availability, and quality care.

Conclusion

Dental practices are under scrutiny every day. Perhaps today dentistry is being affected by the actions of Congress, or the local firehouse is reviewing a hazardous waste permit, or a Los Angeles journalist has just written an article about the uninsured, or a dental plan is reviewing billing procedures. Perhaps a local city councilmember has just called together a task force to ban the use of mercury products or asked for a local vote on fluoridation. The dynamics of the public, the media, lawmakers, regulators, and other special interest groups create endless possibilities for oversight of a practice and continue to challenge a dentist's ability to provide quality dental care to patients.

To request a printed copy of this article, please contact/Cathy Mudge, CDA Government Relations Office, 1201 K St., 15th Floor, or at cathymu@cda.org.

Proposition 65 in the Dental Office

TERESA J. PICHAY AND LINDA J. SEIFERT

ABSTRACT In the mid-90s, dentistry became included in enforcement activity for Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986. This year, 80 dental offices were served with 60-day notices for failing to post Prop. 65 warnings. The California Dental Association has been inundated with inquiries on what dental offices should be doing with regard to Prop. 65 requirements. This article provides a brief history of Prop. 65 and answers the questions most frequently asked of CDA.

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Several events occurring this year have accelerated organized dentistry's actions with respect to California's Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986. This initiative, adopted by a two-thirds majority, was portrayed as consumer legislation to ensure safety of the state's drinking water. It prohibits businesses with 10 or more employees from knowingly discharging or releasing any chemical "known to the state to cause cancer or reproductive toxicity" into any source of drinking water. It also requires that businesses give any individual a "clear and reasonable warning" prior to exposing an individual to a chemical "known to the state to cause cancer or reproductive toxicity."

Dentistry became a target of the statute in the mid-1990s when the Environmental Law Foundation served a number of dental amalgam manufacturers with violation notices. Ever since, the dental "industry" has figured into Proposition 65 enforcement activity. This year, dental offices have received requests to post amalgam warning signs from more than one dental supply company, and several settlements involving dental manufacturers or supply companies have been finalized. In addition, as of early spring, 80 dental offices have been served with 60-day notices for failing to post Proposition 65 warnings. The California Dental Association has been inundated with inquiries on how and why dental offices should respond to these activities. This article provides a brief history of the Proposition 65 initiative

and its impact on the dental industry. The article includes the questions most frequently asked of CDA.

Does the law apply to me?

The law applies to business with 10 or more employees. The historical framework shows the process by which dental manufacturers, suppliers, distributors, and dental offices became objects for Proposition 65 compliance. Dentistry's first inclination that the law would affect it occurred in 1993 when the Environmental Law Foundation served violation notices on several amalgam manufacturers. Most manufacturers banded together and began legal challenges. One manufacturer settled in 1995 with the Environmental Law Foundation and distributed amalgam warning signs to its customers. Another manufacturer petitioned the state's Office of Environmental Health Hazard Assessment to remove "mercury and mercury compounds" from the Proposition 65 list of chemicals. CDA, with the assistance of the American Dental Association, supported the petition with scientific information. The petition was nevertheless denied.

On behalf of all members, CDA participated in settlement discussions between the Environmental Law Foundation and amalgam manufacturers. CDA wanted to ensure that any warning a dental office provides would also preclude further Proposition 65 action against that dental office. Since mercury is not the only Proposition 65-listed chemical used in dentistry, during settlement discussions CDA proposed language that would generally include other dental materials in a warning. After reaching agreement with the Environmental Law Foundation and manufacturers, CDA's proposal was submitted to the Attorney General's Office for review in early 1999. The Attorney General's Office did not approve the warning on the grounds that the source or cause of exposure was not specific and accordingly did not meet

the Proposition 65 requirements. CDA submitted additional information to the Attorney General's Office, detailing the dental products and chemicals to which the public could be exposed. This information was developed based upon the review of one dental office's material safety data sheets. Again, the Attorney General's Office indicated that an appropriate Proposition 65 warning must clearly state the source of the exposure. The Environmental Law Foundation and amalgam manufacturers then continued with settlement discussions without CDA and reached an agreement in late 2000. CDA continued to consider options to provide dental offices with the maximum protection from Proposition 65 actions.

In October 1999, another environmental group, Consumer Cause, served violation notices on Western Dental Centers and, later, on Smilecare and Community Dental Services, Inc. The notices allege exposures to nickel, nickel compounds, nickel carbonyl, and chromium (hexavalent compounds) from orthodontic appliances and dental crowns, and exposure to mercury and mercury compounds from dental amalgam. Western Dental then took the unusual step of serving 60-day notices on its suppliers: Lancer Orthodontics; American Orthodontics Corp.; JB Dental Supply, Inc.; and Southern Dental Industries, Inc. These suppliers have now reached settlement agreements with Western Dental, with the result including a cash settlement plus the distribution of amalgam warning signs.

Consumer Cause in 2000 further proceeded to challenge dentistry's compliance with Proposition 65 by serving notices on several dental suppliers for failing to warn of the danger of nickel in orthodontic products. The Environmental Law Foundation served additional notices to several dental suppliers for mercury in dental amalgam. The amalgam suppliers and manufacturers, collectively known as the Committee of Dental Amalgam Manufacturers and Distributors, settled with the Environmental Law Foundation,

which resulted in the dissemination of more warning signs. Individual dental offices became directly involved in Proposition 65 early this year when even another environmental group, As You Sow, served 80 offices in the Los Angeles area with 60-day notices.

How is the law enforced?

The attorney general, any district attorney, or any city attorney of a city with a population in excess of 750,000 may enforce Proposition 65. In addition, Proposition 65 has a "private enforcement" provision that allows individuals and organizations "acting in the public's interest" to initiate cases. Before private enforcement actions can occur, several preliminary conditions must be satisfied. One condition is that private enforcers must provide a "60-day notice" to a targeted business, the attorney general, district attorneys, and city attorneys that set forth the alleged Proposition 65 violations before any lawsuit is formally initiated. If resolved in this manner, private enforcers may recover from the defendants the costs incurred in pursuing the Proposition 65 action and a percentage of any penalties levied against the defendants. The law specifies that any business found in violation is liable for a civil penalty not to exceed \$2,500 per day for each violation.

Should dentists post a notice?

Dentists are encouraged to post the statutorily mandated notices. The association is in continual communication with the Attorney General's Office regarding the language to be incorporated into a warning sign. The difficulty arises in crafting warning language acceptable to both the regulators and CDA because the number of dental products that contain chemicals included in the Proposition 65 list is extensive.

Those charged with enforcing the statute want to avoid "over warning" or, in their view, warning of exposures that are "insignificant." CDA, on the other hand,

wants any warning to be inclusive enough that it warns of all the exposures that may subject an office to violation notices while not alarming the patient into refusing needed dental treatment. In addition, the statute makes a distinction between chemicals that cause cancer (carcinogens) and those that cause birth defects or other reproductive harm (reproductive toxicants). The “perfect” warning language remains elusive because of a continuing dispute over the enforcer’s preference for singling out amalgam -- or mercury -- in any approved warning.

Three alternative proposed warning methods have been submitted for the attorney general’s review. If the alternative warning systems are approved, each dentist will have several options available, and each dentist can select the warning most suitable for the practice.

The warning should be printed on approximately 8 ½-by-11-inch paper of durable quality and have large, easy-to-read print. The word “warning” should be typed in letters at least one-inch high, and the remaining letters should be at least one-half-inch tall. The warning should be posted in a location or locations that provide a “clear and reasonable” warning prior to exposure.

The second alternative warning method would consist of the above warning sign and an explanatory brochure directly adjacent to the sign. The brochure would list a number of additional specific products and describes the statute in greater detail. The third warning option would consist of a brochure only. The brochure would be provided to a patient at undetermined intervals calculated to give the patient clear and reasonable notice prior to exposure. The dental office would be required to retain proof that the patient received the notice.

How is “employee” defined?

Only businesses with 10 or more employees are required to comply with the warning requirements. Of course, all full-time staff members are counted.

The definition of an employee, however, is broad and encompasses part-time employees who provide only limited services for the office. Part-time janitors, delivery staff, and even bookkeepers may fit the statutory definition and will need to be counted among the total. When in doubt, one should err on the side of inclusion rather than exclusion to be absolutely safe.

I have two offices with fewer than 10 employees at each office, but the combined number of employees is more than 10. Must a Proposition 65 sign be placed at each office?

The operative word in this situation is “office.” If the dentist has two offices or “businesses,” by statutory definition, then signage could be required for each location. If each location is a different “business,” in a legal context, and the number of employees -- full- and part-time -- does not exceed nine in either one, then no signage is required under the statute. Alternatively, if one of the offices employs more than 10 people, signage will be required for that office.

I have had a warning posted. Can I still be liable for damages under the statute?

It is possible. If an office has a clear and reasonable sign posted, however, that warns of the exposures occurring in the office, the dentist should be free from liability from the first posting day forward. The environmental groups and CDA disagree regarding the date on which dentists were first required to post notices; and until the issue is resolved, dentists are urged to post notices.

Liability for damages also depends upon the sign’s language, size, and location. It should provide the patient clear and reasonable notice, in a place where people to be exposed can see it, of the names of chemicals utilized in the office that are known to the state of California to be a cause of cancer, birth defects, or reproductive harm. Recent settlements

require that the warning identify which chemicals are reproductive toxicants and which are carcinogens. The notice requirements for the former are more stringent than for the latter.

The warning language may change in the future. It is not a static process. New chemicals can be added, and scientific evidence validating the significance or insignificance of risk of various substances can transpire and result in additions or deletions from the list. Also, external forces such as litigation can result in alterations to the warning signage. Although a one-year compliance window is given to newly added chemicals, failure to comply with changes in warning requirements could result in violations subject to penalty.

Must I adhere to the warning language distributed by CDA?

No. But we would encourage you to do so until this matter is resolved through negotiation and settlement. The signage that CDA has submitted is intended to satisfy the statutory and regulatory scheme, but it has not been approved by the attorney general’s staff. CDA’s interest is in devising a warning that will be sufficiently broad to cover all materials in the dental office but specific enough to encompass the specific products that appear to be of paramount interest to the private enforcers. We expect that the sign verbiage that is included in this article will not be the final wording as we continue with iteration after iteration to identify the wording that will satisfy the state of California, the environmental groups pressing for enforcement of the statute, and the dental profession. Accordingly, a dentist can post a warning that is different from what CDA has suggested, but challenges may prove more difficult to defend. Any warning, no matter who the author, must be “clear and reasonable” and warn of exposures to chemicals on the state’s list that are used in a particular dental office.

I don't use some of the products or chemicals included in the recommended warning -- do I have to include them in my Proposition 65 warning system?

No. The statute requires only that a warning be provided for the chemicals that are used in the business. The chemicals that have been the subject of violation notices to dental offices and manufacturers include amalgam (mercury, methylmercury) and orthodontic wires and braces (nickel, nickel compounds, chromium or hexavalent compounds, nickel carbonyl). While there are other chemicals on the list that are used in the dental office, most -- if not all -- are perceived to provide "no significant risk" to the public as that term is defined in the statute.

Where does the Proposition 65 sign have to be posted?

Other than that the warning be clear, reasonable and provided to the consumer prior to the exposure, no mandate regarding the method for providing the notice is included in the statute. In fact, the notice does not necessarily need to be posted. Posting, however, is the most frequently utilized method to warn consumers of Proposition 65 exposures.

Settlements in other Proposition 65 challenges are unambiguous, though, in their mandate that the consumer receive clear notice of the exposure. Under the precedents set by other industries as a result of their settlements, the dental office should determine what location in the office will afford the patient a reasonable opportunity to receive notice of the exposure.

Does my liability insurance cover Proposition 65-related claims?

Only the insurance company can provide a definitive answer to that question. One carrier advises, however, that failure to post a warning required by state statute is not the type of risk anticipated by a general liability policy. It is regulatory in nature and accordingly

not covered. Dentists should check with their own carriers if they have questions.

How has the law been challenged?

Since its passage in 1986, many -- predominately unsuccessful -- challenges have been made. Some have argued that U.S. Food and Drug Administration approval of a drug or product preempts state statute, and warnings should not be required for chemicals determined safe by the FDA. Dental amalgam is one of the chemicals that falls within that category. The exposure threshold mandating a warning under Proposition 65 is far more stringent than required by the FDA. The courts have ruled, therefore, that FDA approval does not preempt Proposition 65 and that warnings are required for certain exposures in spite of the FDA's determinations. Challenges to the statutory methodology to obtain an exemption under the statute have been futile. Other challenges -- for instance, that informed consent laws supercede Proposition 65 warning requirements -- have proven unsuccessful so far; but at least one case on this issue is still in the courts.

Very recently, though, the attorney general announced an intention to introduce legislation to "clarify" the statute. In particular, that office seeks limitation on private enforcement provisions and procedures adopted to prevent "over" warning. Comment is invited of interested parties, and CDA expects to make recommendations.

How are chemicals added to the Proposition 65 list?

The list began with a few chemicals and now includes more than 700. According to the law, chemicals may be added to the list in one of three ways. The first method described in the statute is "if in the opinion of the state's qualified experts it has been clearly shown through scientifically valid testing according to generally accepted principles to cause cancer or reproductive toxicity." There is no definition of "state's qualified experts." The second method is "if a body considered to be authoritative

by such experts has formally identified it as causing cancer or reproductive toxicity." The third method is "if an agency of the state or federal government has formally required it to be labeled or identified as causing cancer or reproductive toxicity." Authoritative bodies include the U.S. Food and Drug Administration, the U.S. Environmental Protection Agency, the National Toxicology Program, and the National Institute of Occupational Safety and Health. The list must be updated once a year.

An up-to-date list of chemicals is available at the Office of Environmental Health Hazard Assessment Web site: http://www.oehha.org/prop65/prop65_list/Newlist.html.

The dental products with Proposition 65 chemicals are considered safe, and there is no evidence to show they cause cancer or reproductive toxicity. Why must a Proposition 65 warning be provided?

The law sets stringent standards for determining if a product is "safe." To be exempt from the warning requirement, a business would have to show for a chemical listed as a carcinogen that the level of exposure is below the "no significant risk" level. The "no significant risk level" is defined as the level of exposure calculated to result in not more than one excess case of cancer in 100,000 individuals exposed over a 70-year lifetime. In the case of chemicals listed as reproductive toxicants, the category in which dental amalgam falls, a business would have to demonstrate that the level of exposure is one-thousandth the level known to cause birth defects or reproductive harm.

While the amount of research on the safety of amalgam could fill a tall building, little research has been done to examine the relationship between cancer and orthodontic appliances, stainless steel crowns, composites, root canal treatment, and other dental products. Also, the Office of Environmental Health Hazard

Assessment has not yet determined the “no significant risk level” for nickel or the “maximum allowable daily level” for mercury and is not likely to do so for at least three years. Since these levels are not set, an application for a safe use determination for dental products with these chemicals may require extensive scientific review.

What do I tell patients who ask about the warning?

First, note that the warning does not state that the dental products or procedures cause cancer or reproductive harm. It states that the products or procedures “may expose” the patient to “chemicals known to the state” to cause cancer or reproductive harm. Dentists, as health care providers, are obligated to inform their patients of the risks and benefits of the care provided. The information the dentist provides should be within his or her area of training, experience, knowledge, and scope of practice. Educational materials from several sources are available to dentists to provide to patients. The Dental Board of California is developing a “Dental Materials Fact Sheet” for use in discussions with patients.

What is the current status?

CDA’s interest is in resolving the Proposition 65 warning issue for all members and to achieve a level of confidence that once an acceptable warning is crafted and properly displayed, a dentist’s warning obligation will be satisfied. To date, CDA has proposed to the Attorney General’s Office three methods by which dental offices can provide a Proposition 65 warning: sign only, brochure only, or a combination of a sign and brochure. Although meetings have been held, the parties are yet to agree on appropriate language. In addition, CDA continues to monitor other settlements and litigation under Proposition 65 and to evaluate CDA’s position on this issue. Further, CDA met

with many of the dentists served with violation notices and with representatives of the environmental group that served them. CDA continues to work toward an expeditious solution to all issues related to Proposition 65.

REFERENCES

1. Health and Saf. Code Sec. 25249.5, et. seq.
2. Health and Saf. Code Secs. 25249.6, 25249.11, subd. (b)
3. Health and Saf. Code Secs. 25249.6
4. The Committee on Dental Manufacturers and JB Dental distributed warning signs to dental offices in early 2001.
5. *Consumer Cause v. Western Dental Centers, Inc.* and the resulting cross-complaints resulted in consent judgments between Western and Southern Dental Industries, Inc.; JB Dental supply Company, Southern Dental Industries, and Lancer Orthodontics, among others. Angress Dental Supply Co., Inc., Burkhardt Dental Supply and 19 other suppliers entered into consent decrees with Environmental Law Foundation.
6. On Jan. 25, 2001, the consumer group As You Sow caused 39 dental offices in the Los Angeles area to be served with 60-day notices of violations under the statute. On Feb. 13, 2001, another 41 offices were served with the identical notice.
7. Angress Dental Supply Co., Inc., Burkhardt Dental Supply Co., Inc. Derby Dental Supply Co., Inc., Degussa-Hals Corporation, Dentsply International, Inc., Henry Schein, Inc., IDE Interstate, Inc., and Patterson Dental Supply are among the manufacturers who participated in the challenges.
8. Kerr Corporation filed the petition in 1996.
9. OEHHA denied the petition in April 1998.
10. See Reference 5, ante.
11. Health and Saf. Code Sec. 25249.7, subd. (c); see also 22 Cal. Code of Regs., Sec 12903
12. Health and Saf. Code Sec. 25249, subd. (d)
13. Health and Saf. Code Sec. 25249.7, subd. (b)
14. Health and Saf. Code Sec. 25249.6
15. Over the several months immediately preceding the publication of this article, several warning iterations have been submitted to the Attorney General’s office for review. While the case law is clear that the statute does not required the “best” warning method available to comply with the statute, a “reasonable” method is required. See *People ex.rel. Lundgren v. Cotter & Co.* (1997) 53 Cal. App. 4th 1373, rev. den., cert. den., 118 S.Ct. 601, reh. den. 118 S.Ct. 900. Agreement has been difficult to achieve. In the interim, CDA believes that the good faith effort on the part of the profession to comply with the statute by posting the notice provided in this article should protect the dentist from noncompliance penalties.
16. Recommendations regarding the paper and size of lettering are based on review of other consent judgments.
17. Labor Code Sec. 3351.
18. Health and Saf. Code Sec. 25249.10, subd. (b)
19. *Ibid.*, see Reference 18
20. A recent settlement involving several orthodontic manufactures concludes that the nickel as used in orthodontic materials poses “no significant risk” within the meaning of the statute and that no warning is required.
21. Health and Saf. Code Sec. 25249.10, subd. (c)
22. *People v. Lundgren*, supra.
23. *Industrial Truck Assn. V. Henry* (9th Cir. 1997) 125 F.3d 1305, *Committee on Dental Amalgam Mfrs. And Distributors v. Stratton* (9th Cir. 1996) 92 F.3d 807, cert. Den. 117 S.Ct. 754.
24. Health and Saf. Code Sec. 25249.8
25. Health and Saf. Code Sec. 25249.10

26. Required by enactment of SB 934 in 1992, the fact sheet will compare various types of dental restorative materials that can be used to repair a patient’s oral condition. The “draft” fact sheet states that dental amalgam is “generally safe.” To request a printed copy of this article, please contact/CDA Legal Department, (916) 443-3382, Ext. 4020.

Restorative materials such as composite and amalgam fillings and crowns, orthodontic appliances such as brackets and wires, and other materials used in dental treatment contain chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm.

Dentistry, Amalgam, and Pollution Prevention

WILLIAM J. JOHNSON AND TERESA J. PICHAY

ABSTRACT California has issued fish consumption advisories because of mercury in lakes, reservoirs, creeks, rivers, and bays. Mercury in these waterways leads to the formation of methylmercury, which is toxic and bioaccumulative. Dental practices and other health care settings contribute a portion of this mercury. Government agencies are implementing programs to reduce mercury pollution. Dentists can reduce their contributions by implementing best management practices. They may also consider using pretreatment technologies as more information becomes available about their use and effectiveness.

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DISCLOSURE

William J. Johnson is employed by the California Regional Water Quality Control Board, San Francisco Bay Region, which is currently undertaking a total maximum daily load process for mercury in San Francisco Bay. As a regulatory agency, the interest of the Regional Board in the subject matter is not financial, although it financially supported his participation in the manuscript's preparation.

Dentists have used amalgam as a restorative material for almost 200 years, and the use of amalgam has improved human health and quality of life. However, amalgam contains mercury, and mercury is a rising environmental concern. Because the U.S. dental industry uses several tons of mercury each year (estimates include 34 metric tons in 1997 ¹ and 48 tons in 2001 ²), it is being asked, and in some places required, to reduce or eliminate mercury in its waste and wastewater. This article provides information on mercury in the global environment, related links to dental practices, and regulatory issues that are putting pressure on dental offices to change some practices.

A Persistent Environmental Problem

Mercury is a persistent, bioaccumulative toxin. It exists in elemental, inorganic, and organic forms. It does not degrade in the environment, but it can change from one form to another and circulate throughout the environment. Elemental and inorganic mercury can be converted to an organic form, methylmercury, through the biological processes of microorganisms, such as those in wetland sediments. Small fish and other small aquatic organisms absorb methylmercury, allowing it to enter the food web. As mercury rises through the food web, it accumulates in living tissues at ever-increasing concentrations. High levels of methylmercury have been found in large, predatory fish, including the fish humans eat. The concentrations

of methylmercury in fish can be 7 million times greater than the concentrations of mercury in the surrounding water.³ The connection between mercury in the water column and methylmercury in fish requires further study, but it is apparent that extremely small mercury discharges into water can result in harmful mercury levels in the environment. In surface waters, such as bays, lakes, and rivers, mercury concentrations less than the parts-per-billion level (i.e., less than one microgram per liter) can be of concern.⁴

In fish, mercury can impair growth and reproduction, cause behavioral abnormalities, reduce feeding rates, and impair predatory success. Birds and mammals that consume large quantities of fish may also consume large quantities of mercury. As a result of mercury exposure, some birds have exhibited reduced feeding, weight loss, impaired growth and reproduction, lack of coordination, hyperactivity and hypoactivity, and liver and kidney damage. The neurological effects of mercury can be especially harmful to mammals that require speed and agility to obtain food or avoid prey. Mercury ingestion can lead to an early death for fish, birds, mammals, and other wildlife. Mercury exposure to plants can inhibit their growth, reduce their chlorophyll content, and damage their roots and leaves.⁵

In humans, mercury is a neurotoxin that affects the brain and spinal cord, interfering with nerve function. Mercury poisoning can result from inhalation of vapor, ingestion of soluble compounds, or absorption of mercury through the skin. Symptoms of exposure depend on the form of mercury, the mode of contact, and duration of exposure. Organic mercury compounds are considerably more toxic than elemental mercury. Adults exposed to methylmercury may experience abnormal sensations in their hands and feet, tiredness, or blurred vision. Higher levels of methylmercury exposure can impair vision, hearing, and speech. Long-term exposure can damage

the kidneys. Pregnant women and nursing mothers can pass methylmercury to their fetuses and infants through the placenta and breast milk. In children, particularly those younger than 6, methylmercury can decrease brain size, delay physical development, impair mental capabilities, cause abnormal muscle tone, and result in coordination problems.⁶

Mercury levels in fish have resulted in several human health advisories for fish consumption. In most parts of California, fish have not been evaluated for their safety, but the California Office of Environmental Health Hazard Assessment has issued mercury-related advisories for fish from Clear Lake, Lake Berryessa, Lake Herman, and Lake Nacimiento. In the San Francisco Bay Area, adults are advised to consume no more than two eight-ounce meals per month of sport fish from the bay or delta, including sturgeon and striped bass. Pregnant women, nursing mothers, and children younger than 6 are advised to limit their consumption to one eight-ounce meal per month. No one should consume any fish from Alamitos Creek, Almaden Reservoir, Calero Reservoir, Guadalupe Creek, Guadalupe Reservoir, or the Guadalupe River.⁷

The Sources of the Problem

Mercury has many useful applications in commercial products. It is also a naturally occurring byproduct of some commodities, such as fuel. Burning fossil fuels, particularly coal, releases naturally occurring mercury into the air. Municipal incineration and medical waste incineration release mercury from wastes. Combustion and incineration are the largest contributors of mercury pollution in the United States.⁸

In California, mercury occurs naturally in the cinnabar deposits of the Coastal Range. During the Gold Rush, the cinnabar deposits were mined, and mercury was shipped to the Sierra Nevada Range to extract gold from gold-containing ore. The legacy of this era is that many rivers, creeks, lakes, and reservoirs of both

eastern and western California contain mercury, and mercury-laden sediments continue to flow downstream into San Francisco Bay. Today, mercury associated with historic mercury mines remains a substantial source of mercury in surface water.⁹

The San Francisco Bay Regional Water Quality Control Board has identified sources of mercury in San Francisco Bay. They include runoff from historic mines in both the Sierra Nevada and the Coastal Range; remobilization of contaminated sediments within the bay; wastewater treatment plants discharging into the bay; and atmospheric deposition, including storm water runoff. The greatest portion of the mercury (about 45 percent) enters the bay through the Sacramento/San Joaquin River Delta, which drains most of the Central Valley. Sediment remobilization is also a major contributor (about 37 percent). Bay Area wastewater treatment plants account for only about 3 percent of the bay's mercury (but when wastewater treatment plants outside the Bay Area are considered, their total contribution is greater than 3 percent because the discharges from Central Valley plants are included within the 45 percent estimate for the delta).¹⁰

Wastewater treatment plants are not designed to optimize mercury removal from sanitary sewage. They do remove about 99 percent of the mercury that comes to them, however.¹¹ This mercury ends up in sludge that is used as a soil amendment, sent to a landfill, or incinerated. In any case, it is returned to the environment. Incineration, in particular, emits mercury to the atmosphere, where it falls to the ground through deposition and precipitation, potentially entering surface water and the food web. The roughly 1 percent of the mercury not captured by wastewater treatment plants passes directly into surface water.

Wastewater treatment plant operators have investigated the sources of mercury in their systems. Mercury loads are difficult

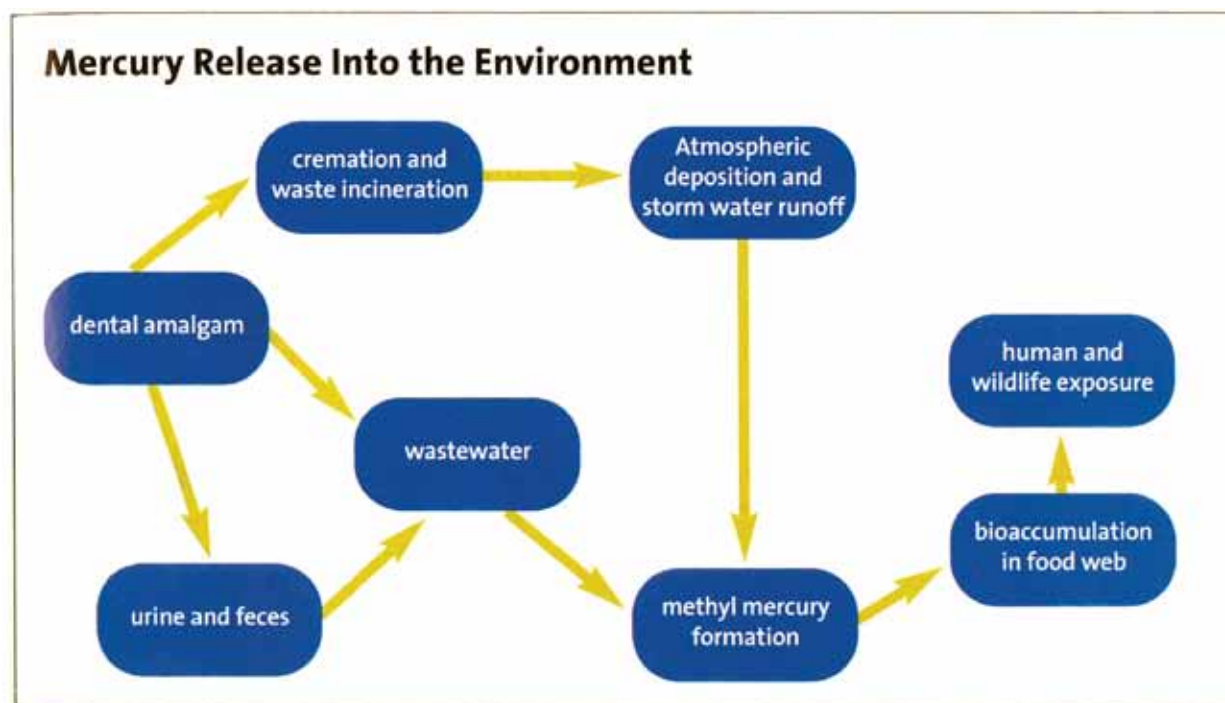


Figure 1. There are many paths through which mercury is released into the environment.

to estimate. The sources of mercury and the percentage of mercury each source discharges to a sanitary system vary considerably among treatment plants. In most cases, however, dental facilities contribute a sizable portion of the mercury at wastewater treatment plants, often exceeding the combined contributions of other industrial wastewater dischargers. Wastewater treatment plant operators have estimated that dental offices contribute from 6 percent to 80 percent of the mercury in wastewater.^{12,13} The wide variation in these estimations can be attributed to attempts to extrapolate from the "typical" dental waste stream. Differences among the numbers and types of restorative procedures done daily, sizes of restorations, and various plumbing set-ups make it difficult to determine the average amount of mercury in dental office discharges. Most estimates, however, have been less than 25 percent of the total wastewater load.¹⁴

In addition to studying dental clinics,

treatment plant operators have been looking at hospitals, laboratories, schools, and certain industries as sources of mercury in wastewater. Treatment plant operators are also looking at mercury-containing products, such as fluorescent lamps, thermometers, batteries, and electric switches, which are typically placed in landfills but sometimes release mercury into the environment through different pathways. Mercury in these products can leach into water or, in the case of broken fluorescent lamps, be emitted to the atmosphere.

As shown in **FIGURE 1**, in addition to contributing to wastewater discharges, dental offices release mercury to the atmosphere if amalgam is improperly disposed of as trash or medical waste that is subsequently incinerated. Mercury is also released when an individual with amalgam fillings is cremated. Crematories typically do not capture mercury from their air emissions. If they did, most current emissions control technologies

would convert these air emissions into wastewater discharges. On average, about 0.6 grams of mercury is released by each cremation.¹⁵

Residential discharges into sanitary sewer systems have also been identified as significant sources of mercury. Mercury in food (e.g., fish) is excreted in urine and feces, and it is also excreted when mercury that escapes amalgam fillings is absorbed. The amount of mercury excreted from individuals with amalgam fillings has been shown to be about 17 times greater than the amount of mercury excreted from individuals without fillings,¹⁶ although other studies have reported factors of 12 and 46.^{17,18} The Association of Metropolitan Sewerage Agencies estimates that human waste from individuals with amalgam fillings contributes more than 80 percent of the mercury in domestic wastewater. For most metropolitan wastewater treatment plants, this amount, by itself, is sufficient to exceed levels of concern for water quality.¹¹

Amalgam, Mercury, and Wastewater

Studies have described dental operator systems and the path of mercury and amalgam wastewater discharges through them. **FIGURE 2** presents diagrams of filter systems typical of many dental facilities. At each chair, there is typically a chairside trap to collect large amalgam particles. As shown in **TABLE 1**, if the wastewater generated by a dentist who routinely removes and places dental amalgam contains roughly 2 grams of total mercury per day (total mercury is measured by acidifying samples to release mercury from amalgam particles), about 1.2 grams of this mercury is captured by chairside traps.^{12,19} Therefore, if the only filter a dentist uses is the chairside trap, he or she could discharge as much as 0.8 grams of mercury to the sewer each day.²⁰ These estimates are very rough and are provided for illustrative purposes.

As shown in **FIGURE 2**, liquid-ring vacuum systems are equipped with vacuum filters (dry vacuum systems may or may not have equivalent filters). Vacuum filters are intended to protect vacuum pumps from particles in the wastewater stream, but they also collect amalgam particles. Some dental facilities with dry vacuum systems are equipped with air/water separators, which may also trap some solids prior to discharge to the sewer.²⁰ The amount of mercury in wastewater passing through chairside traps and vacuum filters, if both exist, appears to be about 0.4 grams per day per dentist.²¹

Attempts to find this much mercury in dental facility discharges have not always been successful. **TABLE 2** lists estimated mercury loads attributed to dentists by different municipalities. These estimates span from about 0.03 grams per day per dentist to about 0.3 grams per day per dentist. In each case, the variation among individual measurements is reported to have been substantial. Mercury loads from the same dental office have varied more than three orders of magnitude for similar activity levels.²² The differences among these estimates account for the

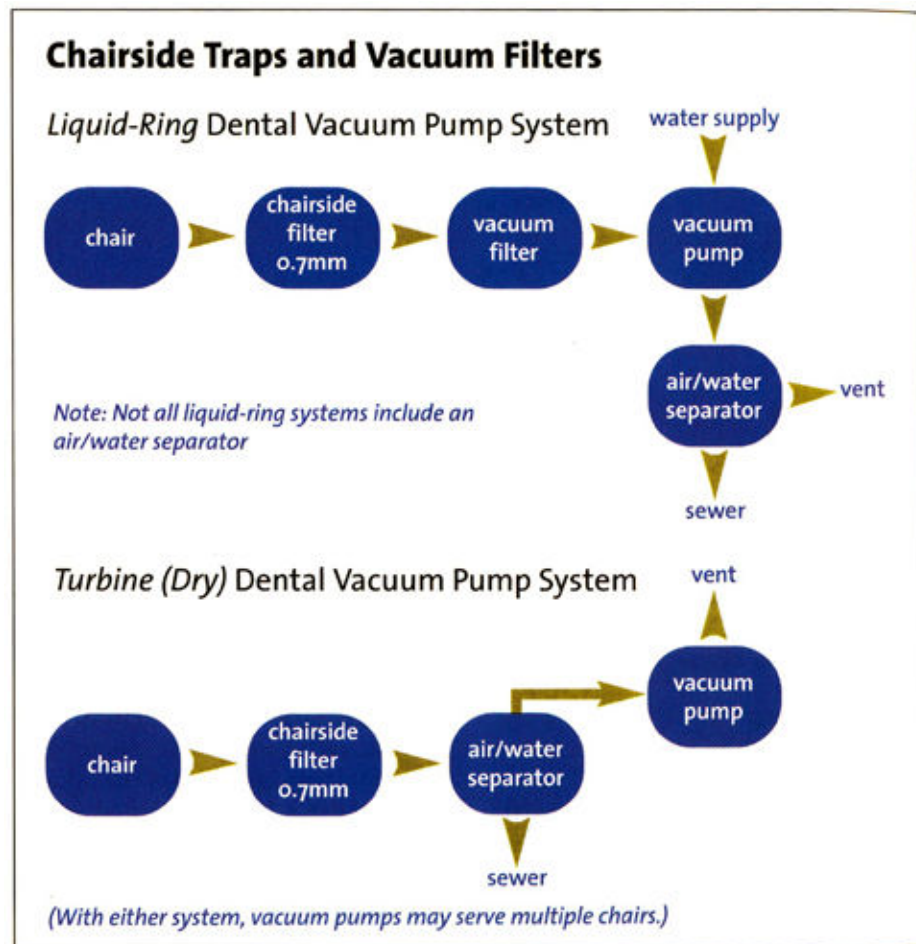


Figure 2. Two typical dental facility filter systems.³⁵

differences in estimated wastewater treatment plant loads.

A major factor affecting the measurement of mercury discharges is suspected to be the settling of mercury and amalgam particles, which are both very dense. There are many locations where dense particles that settle can become trapped on their way to a wastewater treatment plant. Many dental office vacuum hoses have flexible accordion folds. The amount of amalgam released from such a hose could have more to do with how the hose is jiggled or moved than with how much mercury enters the hose at any particular time. Disturbing a vacuum line could dislodge particles and result in uneven releases. Particles could also build

up in a line until reaching a large enough mass to result in a sudden release. Such uneven releases could explain the wide range of individual sample results reported by investigators.

Plumbing systems also contain low points, ridges, and crevices that can capture small sediments. Particles may not readily dislodge from these areas and may build up over time. Trapped amalgam particles would be expected to continually leach small amounts of mercury as time passes. Mercury has also been found in many p-traps under sink drains. Therefore, wastewater samples collected outside a dental building may actually reflect historical mercury and amalgam use more than current mercury and amalgam use.

As dental activities continue, the mercury levels in plumbing systems could approach a steady state, where releases from mercury trapped in the pipes make up almost the entire mercury discharge. A study of 20 Danish dental clinics found no correlation between the number of amalgam surfaces produced or removed at a clinic and the amount of mercury found in its simultaneously collected wastewater.²³ The results of this study suggest that mercury discharges potentially relate to several complex factors and do not simply correlate with the day-to-day activities at each operatory.

Compared to the elemental and ionic forms of mercury, mercury bound within amalgam particles may be less available for conversion to ecologically harmful methylmercury. Amalgam particles may also be more readily removed by wastewater treatment plants. Wastewater treatment typically involves sedimentation and filtration. Therefore, the ecological significance of amalgam particles is uncertain. A study commissioned by the American Dental Association simulated a typical wastewater treatment process under both aerobic and anaerobic conditions. The study did not detect mercury of more than one part per billion when amalgam particles were subjected to simulated wastewater treatment procedures.²⁴ However, mercury may be environmentally relevant at levels less than one part per billion. A study to determine whether certain oxidizing disinfectants in the waste stream, such as hypochlorite, could dissolve amalgam particles found that smaller particles may be easier to dissolve than larger ones.²⁵ In wastewater, therefore, the smallest amalgam particles may be more likely to release biologically available mercury into surface water than may the larger ones.

Most amalgam particles flowing to a wastewater treatment plant are trapped in the sludge recovered during the treatment process. In many parts of the United States, this sludge is incinerated, although this practice is less common in

TABLE 1. BASIC FILTER EFFECTIVENESS^{12,35}

	Mercury Load (g/day/dentist)	Mercury Load (g/day/chair)
Total mercury generated	2.0	1.3
Amount retained by chairside trap	1.2	0.8
Amount passing chairside trap	0.8	0.5
Amount passing secondary filter ^a	0.4	0.3
^a The load per dentist passing secondary filters is estimated here on the basis of the ratios between the other loads in the table (per dentist and per chair). Actual measurements vary widely.		

TABLE 2. Estimated Dental Facility Mercury Discharges²³

Location	Mercury Discharge (grams/day/dentist)
San Francisco	0.035
Cleveland	0.042
Seattle	0.064
Boulder, Colo.	0.10
Boston	0.043 to 0.27
Duluth, Minn.	0.1 to 0.3
Aarhus, Denmark	0.25

California. Sludge incineration, medical waste incineration, refuse incineration, and cremation release mercury from amalgam particles. Therefore, in the environment, these emissions may be more easily converted to methylmercury than may any amalgam particles discharged directly from wastewater treatment plants. The forms of mercury in feces and urine may also be more available for biological uptake than most amalgam particles. The capability of mercury in the environment to enter the food web is an important consideration when developing and prioritizing pollution prevention strategies.

The Regulatory Environment

The mercury-related fish consumption advisories have stimulated enhanced efforts to control mercury discharges in surface water. Government agencies at the federal, state, and municipal levels are addressing the mercury issue; and environmental activists are watching.

Because mercury concentrations in many water bodies are far greater than acceptable levels, some regions have decided to simply eliminate all mercury discharges to the extent possible, beginning with the largest sources that are easiest to control. In the Great Lakes area, the United States and Canada have adopted a “virtual elimination” policy to reduce discharges of persistent, bioaccumulative toxic substances, including mercury.²⁶ The United States has agreed that, by 2006, it will reduce its deliberate mercury use and its mercury releases from human activity by 50 percent.²⁷ The Chesapeake Bay and Everglades areas are also addressing significant mercury problems.

In California, the State Water Resources Control Board and the nine Regional Water Quality Control Boards are acting to reduce mercury levels in fish. In accordance with the federal Clean Water Act and California’s Porter-Cologne Water Quality Control Act, these agencies place limits on the amounts

TABLE 3. Mercury Do's and Don'ts for Dentists^{1,14,16}

Do	Don't
Use precapsulated amalgam.	Use bulk mercury.
Recycle unwanted bulk mercury.	Combine mercury and nonmercury waste.
Recycle scrap amalgam.	Rinse traps in the sink.
Recycle waste from traps.	Put mercury in medical waste containers.
Replace or clean traps regularly.	Place mercury waste in the trash.
Toss empty amalgam capsules in the trash (unless incinerated).	Use oxidizing line cleaners or disinfectants (e.g., bleach).

of pollutants that municipal wastewater treatment plants may discharge. In turn, the cities and counties that operate these plants require industrial dischargers to comply with restrictive permits. Few municipal agencies require dental facilities to obtain such permits. In the past, when a municipality attempted to control mercury discharges by requiring dentists to obtain these permits, the California Dental Association sued the State Water Resources Control Board, the San Francisco Bay Regional Water Quality Control Board, and the Office of Administrative Law. As a result of a 1998 settlement, these agencies agreed to review mercury regulations and develop a regional regulatory policy that accounts for historic and ongoing mercury sources. The San Francisco Bay Regional Water Quality Control Board, in particular, agreed to review mining, natural background, atmospheric, point, and nonpoint sources, and study the fate and transport of mercury in San Francisco Bay. The agencies agreed to work cooperatively with other agencies with jurisdiction over mercury sources, and not to promulgate any specific regulation of dental amalgam while developing the regional policy.²⁸

Industrial permit requirements have improved water quality throughout California, but they have done little to reduce mercury levels because the targeted industries do not discharge much mercury. Where existing permitting requirements have proven inadequate to ensure that water bodies achieve water quality objectives, the federal Clean Water Act

mandates a special regulatory process, known as a total maximum daily load. This process is intended to identify the sources of a pollutant and allocate discharges among the sources to ensure that water quality standards are met.

The San Francisco Bay Regional Water Quality Control Board is undertaking the total maximum daily load process for mercury in San Francisco Bay; other agencies throughout California are addressing other water bodies. Through the process, the San Francisco Bay Regional Water Quality Control Board has completed much of the work called for by the 1998 settlement agreement. The California Dental Association has participated as a stakeholder in the process, and both sides have benefited from the dialogue.

As a result of the total maximum daily load process, the San Francisco Bay Regional Water Quality Control Board and other agencies, such as the U.S. Environmental Protection Agency, are addressing the largest sources of mercury in San Francisco Bay. Strategies to clean up historic contamination are being developed. Eventually, if mercury discharges to San Francisco Bay do not decrease, however, the San Francisco Bay Regional Water Quality Control Board may seek to change the discharge limits it places on wastewater treatment plants. By decreasing these limits, the San Francisco Bay Regional Water Quality Control Board could cause municipal wastewater treatment plant operators to seek new

ways to reduce their mercury discharges. In time, municipalities may require dental offices to obtain industrial wastewater permits. Whether and to what extent they pursue this strategy is unknown. They are likely to first pursue voluntary pollution prevention strategies.

Mercury Pollution Prevention in the Dental Office

Individual dentists exhibit varying levels of awareness about environmental issues. Their awareness about mercury in the environment likely affects their waste management practices. Personal anecdotes and surveys conducted by treatment plant operators suggest some dental workers may not clean chairside and vacuum traps appropriately. Some workers may dispose of amalgam with medical waste, which is typically incinerated, releasing mercury into the atmosphere. On the other hand, many dental facilities implement “best management practices,” and some have installed state-of-the-art pretreatment devices, such as amalgam separators.

Best management practices are the simplest practices dentists can implement to reduce their mercury discharges, and they encompass a range of “common sense” or “good housekeeping” strategies. As shown in **TABLE 3**, the primary best management practices suggested for dental facilities include recycling mercury and scrap amalgam, and keeping mercury and amalgam out of sinks, trash, and medical waste bins. The California Dental Association and local and regional environmental agencies promote best management practices through such means as the “Never the Down Drain” brochure distributed in San Francisco and other materials distributed by the City of Palo Alto and the Los Angeles Bureau of Sanitation.

Best management practices require some training and vigilance, but they are typically cost-effective. From 1996 to 1998, the University of Michigan Department of Occupational Safety and Environmental Health conducted a mercury reduction project for the university's School of

Dentistry wastewater. The implementation of several best management practices, including discontinuing the discharge of suction waste to the sewer and cleaning or replacing sink traps, resulted in mercury concentrations in wastewater near or less than the 0.2 part per billion analytical detection limit for the project.^{29,30} Although some agencies may desire lower mercury concentrations (lower detection limits are now attainable), the University of Michigan experience offers a definitive success story.

Low-technology pretreatment technologies, such as filtration and settling, can effectively capture significant amounts of amalgam particles passing through chairside traps.³¹ Removal efficiencies of more than 95 percent can be achieved using technologies currently on the market. Vendors include ADA Technologies, Avprox, Dental Recycling North America, MDS Matrx, Metasys, Nalco, Reber Ecological Systems, and SolmeteX. Their products rely on various combinations of sedimentation, filtration, ion exchange, and adsorption technologies to trap mercury that would otherwise be discharged to the sewer. Those that best address the smallest, most readily soluble amalgam particles (those most likely to bypass treatment and be converted to methylmercury) may most benefit the environment. The ease of maintenance and cost of the equipment varies considerably, however. The original equipment purchase ranges from about \$200 to \$3,000, and annual maintenance costs range from less than \$400 to as much as \$2,500, including amalgam disposal costs.^{14,20,32}

Agencies in Seattle; Duluth, Minn.; and Saint Paul, Minn., have investigated some of the separation technologies on the market. The Massachusetts Water Resources Authority has demonstrated that at least one type of separator can reduce mercury discharges from clinics by roughly 95 percent. (The product also reduced silver concentrations; but, surprisingly, it appeared to increase

copper and zinc concentrations.)¹⁴ The International Organization for Standardization has adopted a standard (ISO 11143) for evaluating the effectiveness of amalgam separation devices. The American Dental Association has pointed out that the standard test does not necessarily represent actual conditions, and no laboratories in the U.S. perform the test. The American Dental Association plans to address the standard, in part, by developing its own testing capabilities.³³

Dental offices that consider the use of separators need to account for a few factors:

- The technology should not affect the effectiveness of the existing vacuum system or reduce the amount of suction;
- Space should be available on the vacuum line to install the equipment;
- Maintenance should be simple, and service technicians should be readily available;
- Operational failures should be easy to detect; and
- The equipment should be easy to disengage from the vacuum line if a problem arises.

Because amalgam use has been linked to mercury in the environment, some have proposed the elimination of amalgam as a restorative material. Although insurance data indicate that amalgam use has decreased in recent years while the use of composite restorative material has increased proportionally,³⁴ industry leaders predict the continued use of amalgam while research and development of alternatives continue. An evaluation of the clinical merits of alternative materials and their potential environmental consequences is beyond the scope of this article. However, it bears repeating to those who seek to change dental practices that dentistry's mission is to improve oral health, and reducing the need for dental restorations has always been at the forefront of the profession.

Conclusion

Concerns regarding mercury in the environment are based on real problems that exist throughout much of California and the United States. Many dental offices can modify their waste management practices to improve pollution prevention efforts. Informed dentists can be relied upon to make reasoned decisions about how to implement best management practices and whether to install pretreatment technologies. Many regulators and environmental activists are sensitive to the concerns of dentists, but they may also seek further action on the mercury issue. Dentists who understand the environmental and regulatory issues that underlie potential pressures to change their practices will be in the best position to suggest solutions that are reasonable, equitable, and effective.

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Monitoring External Forces that Affect the Practice of Dentistry

EVE CUNY, RDA, BA

ABSTRACT Dealing with the varied and often changing requirements and regulations that affect every dental practice can be a daunting task for the dentist and dental staff. Knowing how and where to access accurate and timely information provides relief for the busy dental professional. This article explores the impact of regulatory mandates and government agency standards on dentistry and provides suggestions for simplifying the search for reliable information.

AUTHOR

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Numerous external forces affect the way dental practices are managed and patient care is delivered. Perhaps the most notable forces in recent years have been the changing landscapes of regulatory policies and legislative mandates. In California, the past 10 years have brought new rules for infection control,^{1,2} ergonomics,³ and injury and illness prevention,⁴ among others. All of these regulations came about as a result of the state lawmaking process. Often the process began months or years earlier on a national level and then “trickled down” to the states for implementation and enforcement. Agencies such as the Occupational Safety and Health Administration and the Dental Board of California are charged with enforcement and administration of these programs.

Dentists have also experienced increased pressure for environmental

compliance, including controlling amalgam discharge to the sewer, collection and disposal of chemicals such as X-ray fixer and disinfectants, and registration of hazardous materials with the state Environmental Protection Agency or local county regulatory body.

Numerous agencies and groups also affect dental practice through mechanisms of recommendations and nonregulatory health and environmental standards. In the area of health and safety, the Centers for Disease Control and Prevention, the National Institute for Occupational Safety and Health, the American Dental Association, and state dental associations may have recommendations and guidelines of which practitioners should be aware. Infection control, sedation, general anesthesia, infected health care workers, latex allergy, and placement of sharps containers are a few examples of areas where recommendations exist in

addition to regulations. Occasionally, when standards are not consistently met, the results are played out in the civil court system and the popular media.

Additionally, dentists are held to a stricter code of conduct than are most nonprofessionals and, indeed, many other professionals. Requirements for relicensure, certification for scope of practice issues, and codes of ethics add to the externally produced pressure dentists must face. The pattern of force and resistance that may emerge as a result of these pressures can be detrimental to the practice and to the dentist personally. Resources are available that assist the practitioner in meeting these demands. Finding, accessing, and implementing these resources can and should be a team effort of the entire practice.

Literature

Numerous print resources are available to the practitioner. However, many dentists, assistants, and hygienists have difficulty finding time to thoroughly review the numerous journals, product catalogs, and other print media they receive.

In addition to the peer-reviewed journals and trade publications supported by industry advertisements, there are subscription newsletters that provide information on products, practices, guidelines, and regulations. These newsletters may vary widely in reliability of the information presented. Additionally, state-specific information may be difficult to obtain but is important in terms of ensuring compliance within an individual office.

Dental School Resources

Dental schools offer some relief to the problem of access, especially for individuals in areas where continuing education programs are available. Often dental schools have a department or individual responsible for regulatory compliance that may be willing to answer questions from dentists in the community. Additionally, dental schools often offer services such as spore testing, courses, workshops, and newsletters that

may assist the dental team with compliance.

The Organization for Safety and Asepsis Procedures

The Organization for Safety and Asepsis Procedures was founded in 1984 by a group of leading dental infection control experts, researchers, clinicians, and dental infection-control product manufacturers. OSAP assists dental practitioners, educators, and manufacturers in accessing and disseminating the most current and accurate infection control and safety information. In the more than 15 years since its inception, OSAP has evolved into a well-respected nonprofit organization that offers educational programs in the form of an annual symposium, regional seminars, and an interactive training program for use in dental offices and schools. OSAP members also receive a monthly focus mailing detailing a topic of interest in the area of dental safety. Topics have included latex allergy, ergonomics, dental unit waterlines, emerging infectious diseases, needle safety legislation, hazard communication, disinfectants, microbial resistance, and many other timely topics of interest to the dental office. Recently, OSAP began offering a subscriber category in addition to its already established member category for those individuals who only want access to the publications and do not have a desire to participate in a membership organization.

OSAP also has a newly revamped Web site (see resource box) that provides recent news releases on topics of interest to dental practitioners, announcements of pending regulatory changes, and opportunities to ask the experts a personal infection control or safety question. This Web site also provides access to such valuable information as a chemical disinfectant chart detailing the characteristics of many of the most commonly used dental office products.

Some of the more recent resources developed by OSAP through committees or by nationally recognized experts are a dental unit waterline position paper, the Interact Training Program, and a position

paper on instrument processing.

Conclusion

Health and safety laws are not likely to disappear in the coming years, although there may be some slowing in the enactment of new legislation due to the recent election of a conservative leadership in the United States. Most regulations require more than a one-time commitment to achieve compliance. Program development and employee training are the beginning of a process that should include regular checks and updates, modification for changes in requirements, procedures and equipment, and ongoing training of all personnel. Trying to carry this out without accessing outside resources may result in frustration, inconsistency, and noncompliance. Using the many resources available to dental professionals is key to simplifying the regulatory compliance process and ensuring that patients and workers are provided the safest environment possible.

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- Selected Internet Resources
- California Dental Association
www.cda.org/cda_member/laws.html
 - Dental-related laws and regulations
 - Organization for Safety and Asepsis Procedures
www.osap.org
 - Numerous resources and membership and subscription information
 - California Occupational Health and Safety Home Page
www.dir.ca.gov/DOSH
 - Regulatory information and compliance resources, such as sample written safety programs
 - Centers for Disease Control and Prevention
www.cdc.gov
 - Data, statistics, and recommendations for such things as immunizations, infection control, disease transmission, prevalence, and epidemiology
 - National Institute for Occupational Safety and Health
www.cdc.gov/niosh
 - Guidelines and recommendations for such things as latex allergy and sharps containers

The Ethical Responsibility of Professional Autonomy

BRUCE PELTIER, PhD, MBA

ABSTRACT Dentistry has historically been practiced autonomously, and many dentists place a high value on professional independence. This article outlines the conceptual basis for professional autonomy and asserts that dentists can retain independence only by aligning values with patients and remaining trustworthy in the eyes of the public.

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Many dentists chose their profession because they could make a good living doing well-respected work in an independent setting.

Most ethics seminars at dental schools include at least one student comment like this: “Well, that’s not the way my father does it in his practice, and I’m going back home to work with him when I finish school.” There is a long tradition of autonomous dental practice in the United States, and most dentists strongly favor independence.

This article makes the point that independence has its place and its price, but total independence is not feasible and may not be responsible. Future levels of professional autonomy for dentists will be determined, for the most part, by dentist behavior.

Background and Theory

Dentists thrive on professional autonomy. Autonomy, in this context, refers to the capacity of dentists to decide, for themselves, how to practice. When they are autonomous, they choose their practice location, and they rent or build offices that please them and fit their practice philosophy (which they also choose). They purchase equipment that makes sense to them. They hire whom they see fit and see patients they choose. They select the materials and techniques to be used. They decide whether to perform root canals, extractions of third molars, and esthetic dentistry. They establish office policies that make sense to them, and they work the days and hours that they pick, given their goals and perceptions of market realities. Most dentists don’t report to a boss. They don’t even have to

cope with a board of directors, as do CEOs. In this rosy (and admittedly overstated) scenario, dentists are at the top of the professional autonomy heap.

Professional autonomy, however, is not a “given,” and it does not exist in a vacuum. Dentists have watched the recent decline of professional autonomy in other professions, including medicine. There are threats lurking for dentists as well.

Professionalism

Dentists, like most people, throw the word professional around without a clear view of what it means and what is involved. Usually, people use the concept to try to get others to conform. “Professional” to many people means “formal.” If you are professional, you wear a certain kind of clothing, you use a certain kind of speech, or you follow certain rules of established behavior. You don’t spit or swear. But this is a misunderstanding of the concept of professional. A more useful definition includes the following:¹

1. Practitioners have an uncommon and important expertise.
2. Practitioners are organized.
3. Practitioners practice autonomously.
4. Practitioners have a special service obligation.

In this model, professional autonomy derives from public permission. Dentists are autonomous because citizens permit it, and the public manages dentist autonomy through the regulatory actions of a state board. As long as dentists take care of people, their autonomy is permitted and endorsed by the public. When dentists abandon their special service obligation, their autonomy is restricted via regulations, examinations, license revocation, and other board actions. Professional autonomy implies obligation. There is an active relationship between the privilege and the duty.

Care and Commerce

Dentists and others who provide direct health care treatments face a special challenge. They must coordinate care

and business, and this can be difficult and confusing because of the conflicting assumptions at the basis of each. The delivery of excellent, patient-centered care in the context of a successful business may be the most challenging aspect of the dentist’s professional life.²

Alvin Rosenblum reviewed economic theory in this journal in March and observed that the central ethical duty of a corporation is to return profit to shareholders and stakeholders.³ Publicly held companies do not have the luxury to make decisions that diminish the bottom line. The commercial premise is competitive, and the players understand the rules. Businesses compete, and they are always seeking something called the sustainable competitive advantage. They state their intention to compete, and they talk themselves into liking it. They don’t only compete with each other; they compete with the consumer. When a consumer enters a store to make a purchase, he or she understands the competitive relationship as it applies to the customer. Each party competes to get the best deal he or she can get. The consumer is unabashedly trying to get as much product as possible for the lowest price, while the store owner is trying to get as much money as possible while giving as little product as he or she must. Everybody knows the rules, and most play by them. Customers know that they should carefully evaluate the product and the situation. They study, compare, and shop. Even though both parties are polite, customers do not expect sellers to look after their interests. Customers must do that for themselves; and in industries where trust is most lacking (e.g., retail automotive), customers can be extremely diligent and even wary.

The arrangement in dental health care is quite different. Since patients are not able to adequately evaluate alternatives, they must rely on the dentist to help them choose. The basic relationship is cooperative. Dentists help patients make optimal choices by providing them with essential information and

honest opinions. Dentists look out for the patients’ interests, not just their own; and patients trust them to do just that. Patients know that they are in a poor position to adequately evaluate the situation (especially if they are in pain or an emergent crisis), so they put their faith in the good will of the dentist. Dentists, on the other hand, make the interests of patients central to their practice, and they do not use their knowledge and experience against patients. They take care of patients and, in return, make an excellent living.

There are many examples or indicators of the essential difference between the commercial view and the ethics of care. In the commercial arena, trade secrets are closely guarded. Most dentists, however, would share a new technique that they have developed. That’s what professional journals are for. Dentists don’t spy on each other to try to steal their knowledge. Knowledge is shared for the benefit of patients. Dentists don’t cold-call patients; they don’t “slam” them on the telephone at dinnertime, as telecommunications companies sometimes do; they don’t offer finder’s fees or kickbacks for referrals; and they don’t snooker the patients of other dentists. They don’t even criticize other dentists. In fact, written codes discourage dentists from making public claims that their service is superior to the service provided by others.⁴

Dentists have a fiduciary relationship to patients, and that is the basis for professional autonomy. As long as dentists can be trusted to take care of their patients, they will be left to practice as they see fit.

Nine Decision Factors

Unfortunately (or fortunately, depending upon one’s point of view), the behavior and decisions of dentists have been subjected to progressively greater scrutiny and regulation over the past decade or so. Eve Cuny and others in this issue discuss examples of recent new regulations for dentists, including rules for infection control, disposal of amalgam, and others related to Americans with

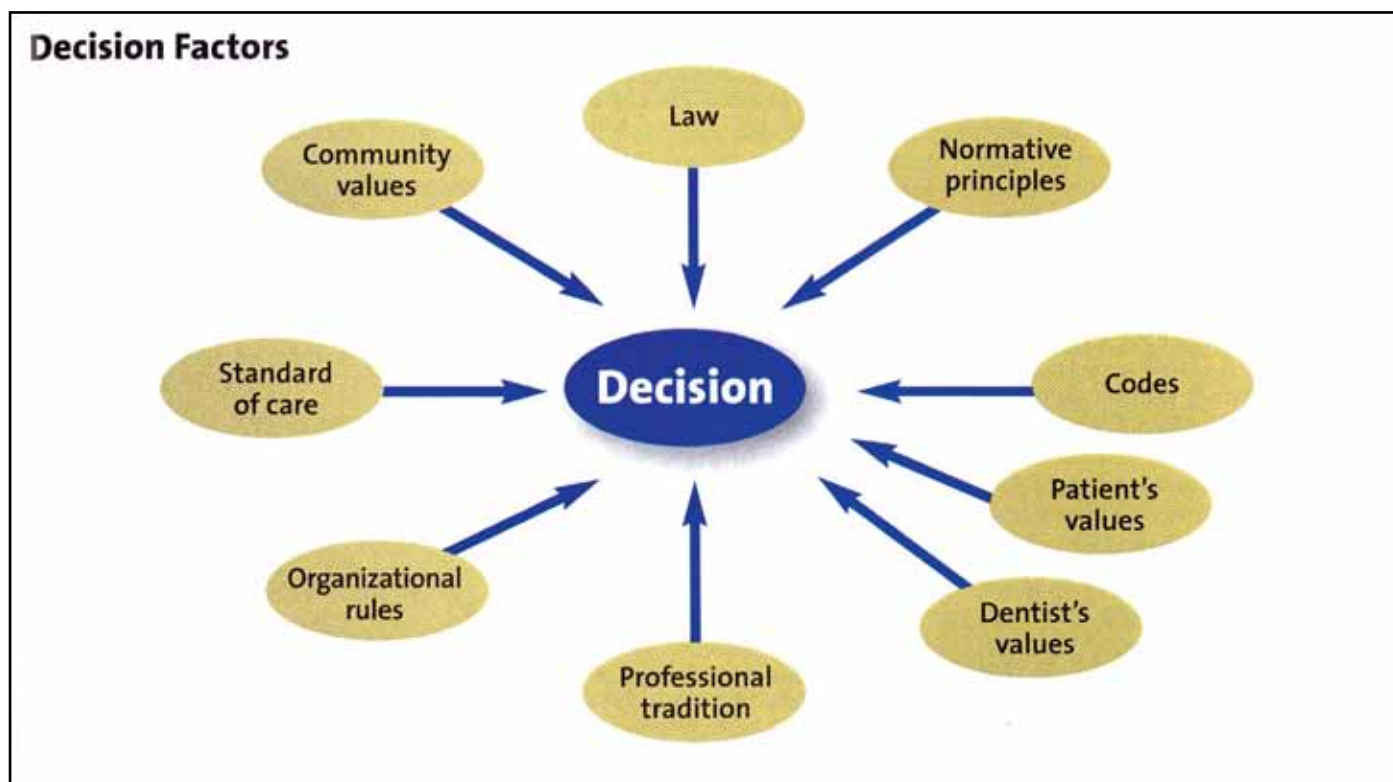


FIGURE 1. Nine Factors That Affect the Dentist's Decision Process

disabilities, sexual harassment, and child and elder abuse reporting.

These rules, imposed by others, are not the only external factors that must be considered by the dentist, however. Dentistry has never really been the isolated technical endeavor that some sentimentalists might imagine. The thoughtful dentist has always realized that there are many complex factors, aside from technical dental considerations, that affect the decision process. Nine such factors are shown in **FIGURE 1**. Here is a brief summary of those nine influences.

Normative principles. These core moral values provide a cognitive map for difficult dentist decisions. They represent collectively assumed norms and are prescriptive. These principles are extremely useful in the day-to-day decision process and include veracity, (patient) autonomy, justice, reparation, beneficence, and non-maleficence, among several others.⁵ Actions are chosen with regard to their

conformity to the spirit of these principles.

Ethics codes. The ADA, CDA, and other organized dentistry groups publish guidelines that represent their aspirational view of how dentists should behave. These codes help dentists understand what colleagues think are the best practices. When these practices are universally followed, laws are pretty much unnecessary.

The law. State legislators, on behalf of citizens (and lobbyists, to be frank), craft and pass laws that bureaucrats translate into enforceable rules and regulations. In California, these rules make up the Dental Practice Act;⁶ and they represent the bottom line, the lowest level of care and behavior tolerated by regulators. These regulators and the rules they create have patients as their constituency. They protect the public from dentists.

Professional tradition. This is an invisible set of guidelines, often not articulated at all. Dentists follow tradition;

and they are typically uncomfortable when it is violated, even when they can't articulate the logic behind their discomfort. Tradition is the reason that virtually all dentists charge fees on a piecemeal basis, even though this may not, indeed, be universally optimal.

Standard of care. This is another invisible standard, and this one is not written, either. It exists in the collective minds of practitioners. This drives dental students crazy, as they try and try to figure it out. They should survey a couple of their favorite faculty members and ask several practitioners in their community for an opinion, then average the answers they get. This is likely to reveal the standard of care related to the matter at hand.

Organizational rules. These apply when a dentist works for another dentist or for a large organization, clinic, or dental school. That dentist must follow an additional set of rules established for organizational consistency, survival, and effectiveness. If a

dentist can't abide by these rules, he or she can't work for the organization.

Dentist's values. Certainly, these play a significant role in the overall tone of a practice, as well as in specific treatment decisions. A good dental practice reflects the best values of the dentist-owner. This is how the independent judgment of the dentist is expressed in actual practice. It is best when a dentist's values parallel the prevailing values of patients in the local community.

Patient's values. In a modern practice, especially one involving well-informed patients who actively take responsibility for their oral health, this variable must be incorporated into treatment and practice decisions. This is where the independence and autonomy of the patient is honored, and patients sense that they are well-cared-for when their values are respected.

Community values. This external factor is probably easy for dentists to accommodate when they are working in a community that is similar to the one they live in or grew up in. This becomes a more difficult variable when a dentist works in a community that is different from his or her own or when dentistry looks at underserved populations.

At least five of the decision influences listed above are external to the dentist and the profession (law, community values, patient values, rules of the organization where the dentist works, and, perhaps, normative principles). These factors represent sources of input that are imposed from outside, and they must be carefully considered by any thoughtful practitioner.

Squandering Trust and Autonomy

Trust in human relations is generally difficult to establish and easy to squander.⁷ When dentists move so fast they don't hear the concerns of their patients, when they make "production" the central value of their practice, when older dentists teach younger dentists that the key to a good professional life is to "select" patients carefully and "dismiss" the rest, when

patients come to the private conclusion that dentists are "money grubbers," if dentists rush to become plastic surgeons of the mouth, and if dentistry ignores large segments of the population on the assumption that individual dentists have no obligation to the underserved, there is a chance that the goodwill that exists between dentistry and the public could be eroded forever.

Summary and Key Concept

The central dynamic of the relationship between health care providers and patients is cooperation, where doctors look out for the interests of patients, and patients trust them to do so. Dentist autonomy is granted by the public in the form of minimal constraint by regulation or other external decision forces. For dentists to retain maximum professional independence, they must continue to meet the special service obligation expected by the public. In other words, as long as dentists are perceived to be trustworthy, to be looking after the interests of the public, they will be left alone to practice as they see fit. But, whenever the public perceives that dentists are not fulfilling their fiduciary responsibilities, they will be constrained in the form of regulations, license restrictions, additional requirements for specific continuing education, and the codification of treatment behavior through mandatory, standardized protocols.

Put simply, it is in the best interest of dentists (especially those desirous of autonomy and independence) to be trustworthy. This not only means that they need to behave well and take excellent care of patients themselves, but they must reach out, from time to time, and assert themselves to monitor and manage others in their profession.⁸ To retain maximum professional autonomy, dentists must get out in front of regulators by regulating themselves. It is in everyone's best interest to do so because regulators respond to the most poorly behaved members of a profession by creating additional regulation

for everyone.

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Top Toad in the Pool

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It is safe to say that most dental students look forward to that day when they can show a clean pair of heels to the university in which they presently sweat. Buoyed by surveys that indicate upward of 70 percent of all dentists work in solo private practices, these survivors of an eight-year indentured servitude are more than ready to shed the shackles of student life and become The Boss. If the university has done its job, altruism suffuses the student heart; and the new dentist, if asked what his or her career objectives are, would reply with feeling, "I want to work with people."

What the university fails to point out is that in spite of diva Barbra Streisand's lyrical claim that "people who need people are the luckiest people in the world," the record shows that many people who work with people all day long are inclined after a while to regard their fellow beings with ill-disguised loathing. Observe the clerks at any big-city Department of Motor Vehicles for confirmation of this.

A more forthright career objective might be stated as "I want to do the best I can to obtain a sense of personal fulfillment by helping others. That this is best measured in U.S. dollars is irrelevant, but ask me about it later."

It seems incredible in this modern sophisticated world of corporate structures that 70 percent of dentists elect to work in

solo isolation, embracing the illusion that they, as The Boss, are living the dolce vita they dreamt of as students.

A Real Boss, defined as the chairman of the board of a big corporation, actually does nothing but is paid exorbitant sums of money for just showing up occasionally to convene the board of directors so they can renew their pledges of obeisance to him. They, in turn, have two or three dozen vice presidents that kowtow to them. Subservient to that bunch are approximately 10,000 middle-management personnel. Near the base of the pyramid are the several thousand secretarial, clerical and gofer people and, finally, at the bottom of the pile is Production.

That's why The Boss has little to do; these people are doing it for him. It is not necessary for The Boss to even know what's being produced -- baby wipes or double-helix flanges -- it's all the same to him.

Guess who is in charge of Production in a solo dental practice? Nobody else but our dentist/boss who stands proudly atop a pyramid of underlings consisting of a receptionist, two part-time assistants and a hygienist who may or may not come in on Thursdays.

The plumber arrives to fix the backup, the lab guy is late, a walk-in shows up at 5 p.m. with a raging toothache, and the last employable assistant on Earth departs

in a huff. Those are the ones whom the dental student was really talking about when he proclaimed, “I want to work with people.” Only he didn’t know it.

Yet, year after year, solo practitioners soldier on, foregoing the imported teak desk in the plush private office with the five or six layers of SS troops between The Boss and petty annoyances. When he or she eschews the bonuses, stock options and retirement funds that come with the territory, one is induced to wonder why.

Well, the people who are paid to conduct inquiries into phenomena such as this say it is a classic example of the “big frog in the little puddle” syndrome. This is not to be confused with those Budweiser commercials featuring talking frogs with tongues the length of a football field.

Having considered myself to be a 70 percent dentist, the primo frog in my own little puddle for well over 50 years, I have examined the frog/puddle analogy from every aspect to reassure myself I have not been misled.

The frog/puddle combinations, i.e., little frog/big puddle, little frog/little puddle, big frog/big puddle are, as Arte Johnson used to assert on Laugh-In years ago, “verrrry interrrresting, but schtoopid!”

In the first place, “puddle” is one of those words that, if repeated often enough, leaves you with the impression

that you must have made it up. Puddle, puddle, puddle. Clearly, this is not the sort of thing you want to spend much time doing lest it indicate the early onset of something more serious.

Secondly, there simply is no satisfactory substitute for being the top toad in the pool. In this exalted position of benevolent despot, nobody tells you what to do. Instead, a support group consisting of your spouse, your kids, the IRS, various insurance entities, utility companies and an all-caring government join to protect you from accidentally following your own inclinations. Corporate America, eat your heart out!