

# Journal

OF THE CALIFORNIA DENTAL ASSOCIATION

OCTOBER 2011

Implementing Strategies

Caries Management

Motivational Interviewing

Advancing

the

**PRACTICE**

of

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Part 1 of 2

Vol 39 No 10

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# Journal

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JANUARY: CDA Research

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Phil Weinstein, PhD

**746** CHANGING THE FACE AND PRACTICE OF DENTISTRY: A 10-YEAR PLAN

*This document is designed to identify the key stakeholders necessary for success and creates a map for reaching the ultimate destination in an expedited manner. The ultimate goal is defined as the utilization of caries management by risk assessment principles in the management of all patients seeking oral health care.*

Douglas Young, DDS, EdD, MBA, MS; Charles S. Ricks, DDS, MPH; John D. B. Featherstone, MS, PhD; Margherita Fontana, DDS, PhD; Susan M. Fournier; Steven P. Geiermann, DDS; Michelle Hurlbutt, RDH, MSDH; V. Kim Kutsch, DMD; Rolande Loftus, MBA; John R. Luther, DDS; Brian B. Nový, DDS; Mark S. Wolff, DDS, PhD; and Allen Wong, DDS, EdD



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## Catch-22

BRIAN SHUE, DDS

Joseph Heller's satirical novel *Catch-22* presents a grand concept of the no-win situation seen through the horrors of World War II combat. In this classic, Capt. Yossarian arrives at the conclusion he really doesn't want to die flying dangerous bombing missions in the European Theater. Knowing the U.S. Army Air Corps does not want anyone unfit to fly in combat, he decides to ground himself by claiming insanity. However, the very act of reporting oneself as not fly worthy due to lunacy actually reinforces the opposite — no one in their right mind wants to fly into combat. Yossarian is told he must continue to bomb the enemy. He is chalked up as another victim of "Catch-22," the unwritten bureaucratic rule and catchphrase used for arriving at an inescapable solution through irrational logic.

Take the unexpected consequences from the results of California Association of Rural Health Clinics (CARHC) and Avenal Community Health Center versus David Maxwell-Jolly, Toby Douglas and California Department of Health Care Services (DHCS) and its yet-to-be-determined impact on dental public health services.

Since its inception in 1965, the federal Medicaid program has classified adult dental care as an optional benefit, determined by each individual state. However, annual budget crises have become all too common in Sacramento in recent years, and California legislators finally decided to eliminate these benefits on July 1, 2009. By cutting out the "optional" dental program, California saved the state fund approximately \$110 million per year. Faster than you can say "balanced budget," Federally Required Adult Dental Services (FRADS), otherwise known as palliative emergency care, became the only surviv-



**"Catch-22" is the unwritten bureaucratic rule and catchphrase used for arriving at an inescapable solution through irrational logic.**

ing Medi-Cal dental benefit for nonpregnant adults 21 years of age and older. These lone benefits exist because they are classified as "physician services" or health care that can technically be provided by a physician, as well as a dentist.

Even though the optional elimination went into effect, adult patients with Medi-Cal benefits still sought dental services (albeit in smaller numbers) at community clinics, but had to pay out-of-pocket for services using a discounted "sliding-fee" category based on income and number in the household.

Enter CARHC, et al. versus David Maxwell-Jolly, et al. filed in March 2010 against DHCS. It stated Federally Qualified Health Centers (FQHCs) and Rural Health Centers (RHCs) were not specifically named in the California code that brought about the elimination of optional benefits and that federal Medicare statutes define dentists, chiropractors, optometrists, and podiatrists as physicians, thus overriding California's removal of "physician services." Finally, the lawsuit argued the federal Centers for Medicare and Medicaid Services (CMS) had not approved the State Plan Amendment (SPA) filed by DHCS to remove the optional benefits in the first place.

In late October 2010, the U.S. District Court ruled there was no conflict with federal law with the definition used for "physician." However, it ruled against DHCS because its SPA did not receive

federal approval from CMS.<sup>1</sup> Because of California's error, the court ordered DHCS to reimburse FQHCs and RHCs for these optional adult dental services for its Medi-Cal patients until CMS formally approved California's SPA.

Thus, basic dental services in the safety-net setting were reinstated for adult Medi-Cal patients. But there was a catch. The submitted SPA awaiting approval had a July 1, 2009, stop date. If CMS approved the SPA as written, it would retroactively eliminate optional benefits back to this original date. That essentially rendered dental services performed as a result of the court injunction as null, and all payments for such services as void, even after the checks had long since been cashed.

Can that be possible? Yes. DHCS posted an update that stated, "Please note that when CMS approves this policy, DHCS may then retroactively recoup any Medi-Cal reimbursements paid to FQHCs and RHCs for these optional services."<sup>2</sup> So dental services are to be provided and DHCS will pay the clinics for these services (as required by the court injunction), but then every single payment made to the clinics for these services may need to be returned at a later date. This did not make sense.

Nevertheless, the clinics do what they do and continued to provide dental care. And the clinics immediately stopped Medi-Cal patients from paying for their

own dental treatment; after all, their benefits were reinstated. So FQHCs and RHCs billed DHCS for dental services, and DHCS reimbursed the clinics for these services. Everything seemed normal on the surface.

Then the last shoe dropped on May 23, 2011, CMS finally approved the SPA as written. It not only stopped optional benefits, it also permitted the July 1, 2009, stop date. Dental benefits were stripped again, but retroactively. And in late August, DHCS told the Primary Care Association it plans to follow through and recoup all the Medi-Cal payments already made to the clinics.

However, FQHCs and RHCs had more than seven months of production and collections in the time period when

the adult services were “reinstated” and then “re-eliminated.” This amount is not miniscule as Medi-Cal patients can make up about 50-80 percent of each clinic’s population and adults account for 52 percent of that number.<sup>3</sup> The demand by DHCS for a retroactive repayment will certainly damage, if not pull the safety net out from under, the safety net clinics of California.

When does something illogical make sense? Obviously, the patients received dental services from the clinics. If required to return the reimbursements to DHCS, will the clinics attempt to have all of their patients retroactively pay for the dental services they received? Would the patients actually be able to

pay for these services? Should the clinics just write off the balances? Twenty-five percent of California’s safety net clinics operate with a deficit.<sup>4</sup> It should not be a surprise if some clinics will have no choice but to close their doors.

DHCS should not seek retroactive repayment from the clinics. The clinics provided adult dental Medi-Cal services to countless patients not take advantage of the situation, but to comply with the results of the injunction. FQHCs and RHCs should not have to suffer financial consequences because of circumstances beyond their control and the people of the Golden State should not have to be left with a devastated public health infrastructure.

The decision to take back all the payments given to the clinics completes a real-life Catch-22. Wrong as it may be, DHCS stated it has the right to do so. One does not have to be sane to realize this is a tragedy. ■■■■



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#### REFERENCES

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4. California's health care safety net: facts and figures, October 2010. California Health Care Foundation. [chcf.org/publications/2010/10/californias-health-care-safety-net-facts-and-figures](http://chcf.org/publications/2010/10/californias-health-care-safety-net-facts-and-figures). (Accessed Aug. 22, 2011.)



## Dental Lab Industry in Decline

Editor:

The excellent article by Bennett Napier, CAE, regarding dental laboratory relations (The relationship between dentists and dental laboratories — predictions for the future. *J Calif Dent Assoc*, 39[8]:569-71, August 2011) was politely accurate in describing the status of the dental laboratory industry in the United States. What he did not mention was how organized dentistry contributed to the fast-declining pool of potential technicians.

During the past 20 to 30 years, there has been a big reduction of enrollees in dental technology schools including community colleges, resulting in the elimination of that source of training. Concurrently, laboratory technicians and their industry have sought better recognition and stature, which they felt would attract more enrollees and could be achieved with some kind of mandatory statutory regulations or licensure reflecting a standard of minimum competency. Unfortunately, organized dentistry, and CDA in particular, has opposed any form of statutory monitoring. Time and again, resolutions brought to the House of Delegates for mandatory statutory requirements were defeated. This lack of foresight has contributed to the present paucity of potential lab techs in the United States.

There was a spark of hope that CDA's opposition would change through Resolution 31 passed by the 2009 House of Delegates. It was submitted by the Policy Development Council and recommended that it continue its discussions and evaluate the issues regarding dental laboratories and technicians with a follow-up report to the 2010 House of Delegates. Again, unfortunately, the report from the PDC to the 2010 House was NOT to change existing policy regarding statutory regulations.

Considering the exquisite prostheses the dental laboratory industry and

technicians provide our profession and the public, it is too bad that CDA has not rewarded them with its support for elevating their stature with licensure or some form of statutory requirements for a standard of competence that they have sought. The result has been severe reduction in the pool of potential techs and a continuing increase of off-shoring with no monitoring of these products.

This situation is even more appalling now that the dentists' requirement at the chair make it impossible for them to develop the skills to do the lab work themselves and now that dental schools teach very little, if any, dental laboratory technology.

**FRANK A. BRUCIA, DDS**

*San Francisco*

Editor:

It's nice to see an informative article showing the need for better communication between dentists and dental technicians (Napier B, The relationship between dentists and dental laboratories — predictions for the future. *J Calif Dent Assoc* 39[8]:569-71, August 2011.) I take an exception, however, to extremely important information being absent.

In the first paragraph of the article, there is an omission in the list of market changes that have affected the dental lab industry. In that list, you have omitted the successful rise in the use of clinical chairside CAD/CAM systems such as CEREC and E4D. To keep that fact out of the spotlight would in essence prevent others from considering the problem and therefore reduce the input of solutions from creative and entrepreneurial thinkers willing to share their successes toward helping to save a weakening industry that does nothing more than help the dentist succeed.

Furthermore, the CDA Dental Lab Task Force Report recommends that action be taken to "actively seek oppor-



tunities to improve collaboration with the California dental laboratory industry and to communicate about dental lab issues, through such venues as *CDA Presents*, *CDA Journal*, *CDA Update*." I can't imagine that the intent of that report was to take action and communicate on just some of the issues.

I'm looking forward to reading future articles that bring full light to problems and solutions to strengthen both the dental profession and the dental laboratory industry through cooperation and transparency in communication.

**STEPHEN D. KILLIAN, CDT**

*Irvine, Calif.*

Editor:

Dentists lead busy lives, and some may have missed California Assembly Bill 1081, which allows counties to opt out of the Secure Communities Automatic Fingerprint Program to screen for citizenship and criminal background. As bill sponsor Assemblymember Tom Ammiano (D-San Francisco) stated, the fingerprint program, "has actually harmed public safety and seriously undercut community policing strategies."

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**Timothy G. Giroux**  
DDS/Broker

## ASK THE BROKER

### Question:

**What is the best way to inform patients of my practice sale?**

That really depends on the practice and your relationship with your patients. A practice that is driven mostly by PPO and HMO plans is different than a practice that is mainly fee-for-service or personality driven. A practice that has had different associates in and out of the practice over the years is also different than a practice that has had only one provider, irregardless of whether it is PPO-driven or not.

In almost all circumstances, we advise that a letter be mailed out on the same day as the close of sale. We also advise the staff or the retiring doctor to call patients who are scheduled the first few days, who may not have received the letter prior to their appointment. While the announcement may seem unusually late, there are some cases when a retirement/sale letter was sent to the entire patient base and the transition did not take place. You can imagine the turmoil that would cause in a practice!

The letter is generally a combined effort of the selling doctor and the new doctor, written as a "goodbye" from the departing doctor and a letter of introduction of the new doctor. Ultimately the final draft is in the complete control of the new doctor since it is their opportunity to convince the patients to return to the practice for their dental care. I would estimate that 95% of our practice transitions include a very brief two week transition with the retiring dentist. (Review June 2011 "Ask the Broker" feature about this issue.) Therefore, in a personality-driven one-doctor transition, this letter is very important. Some doctors have even hosted an "open house" to introduce the patients to the succeeding doctor and say goodbye to their patients. This is rare and I believe not necessary, but again, it all depends on the relationships in the practice.

Some buyers decide that a letter to the patients is unnecessary. If the practice is PPO, HMO driven, or has had many associates in recent years, the patients are either not personally connected to the retiring doctor, or not surprised if a different doctor will be completing their treatment. The buyers correctly surmise that a letter introducing the change maybe more detrimental than beneficial. Instead, they will have some brochure or letter at the front desk which informs the patients of their "unparalleled" qualifications to continue their dental care.

The bottom line is that most patients, (up to 95% estimated by some management companies) will return to the practice if their x-rays are there, the hygienist or front office personnel are there, or simply because that is where they go for their dental care. Unless the patient is in pain, dental care is not high on their list of concerns.

**Timothy G. Giroux, DDS** is currently the Owner & Broker at **Western Practice Sales** ([westernpracticesales.com](http://westernpracticesales.com)) and a member of the nationally recognized dental organization, ADS Transitions. You may contact **Dr Giroux** at: [wps@succeed.net](mailto:wps@succeed.net) or 800.641.4179

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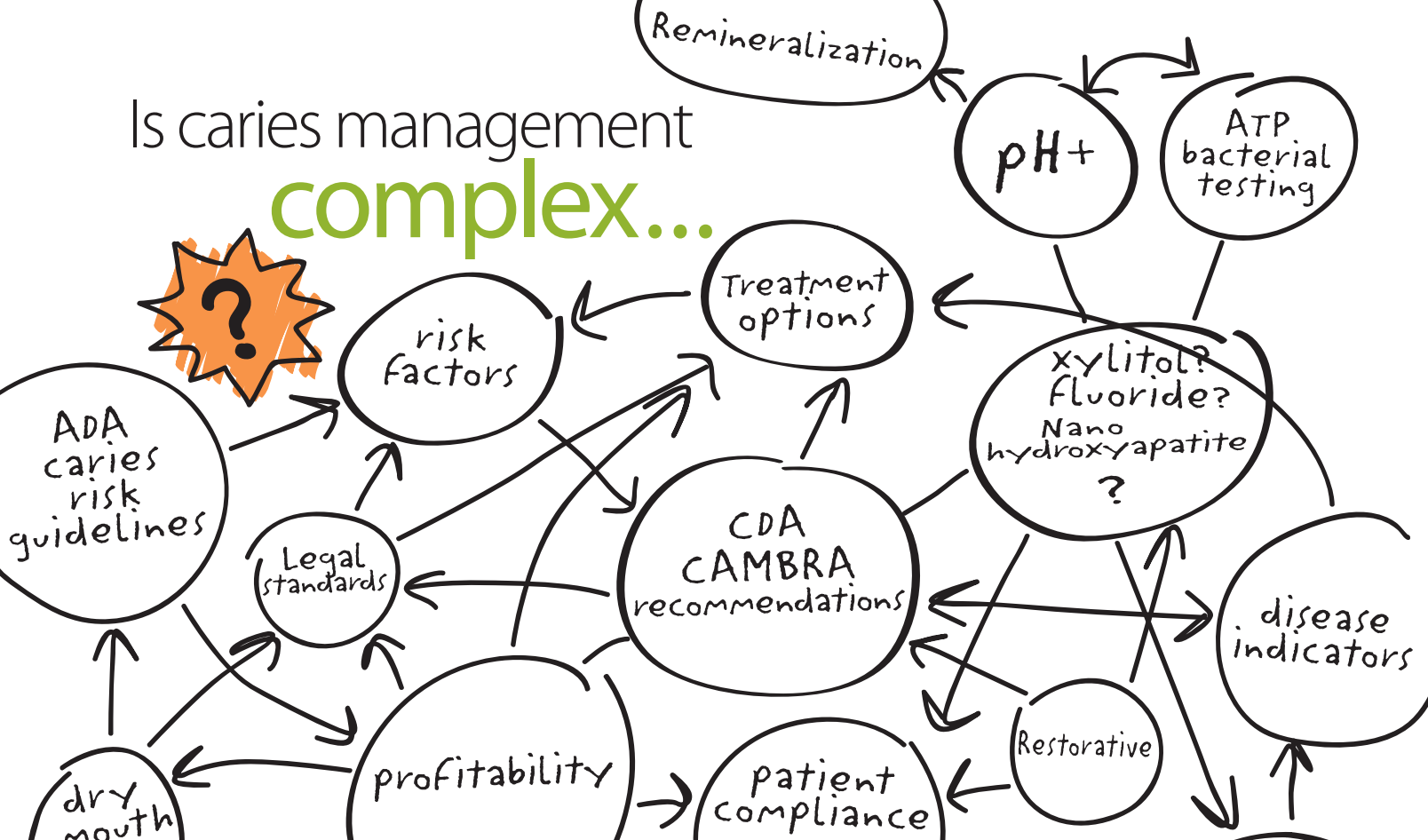
So, if it is politically unacceptable to use fingerprints to identify convicted criminals here illegally, tell me why, after 32 years of practice, it's necessary to have my fingerprints in Big Brother's system to keep my license current.

**MICHAEL COOK, DMD, FAGD**  
Milpitas

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Matt Mullin

## Practical Morality

BY DAVID W. CHAMBERS, PHD

Confucius said (really, he did): A country will experience eternal prosperity if the ruler can govern ethically for a single day. We're still waiting.

All of us make the effort from time to time, but we are morally flawed. One of the common flaws is to talk as though perfection were something worth talking about. I propose that we stop talking about perfection because that gives us an excuse for stopping when we feel like it. Instead we should focus on achieving a practical level of moral behavior.

Most immoral behavior is committed by people who consider themselves to be basically ethical. Several years ago it was reported by the California State Attorney General that insurance companies had overcharged drivers by \$5.2 billion. Later the media reported that during the same period, drivers

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## Choose Irrigants Wisely During Endo Treatments

Markus Haapasalao, DDS, PhD, chair of the endodontics division at the University of British Columbia in Vancouver, recently wrote about the irrigation choices available to dentists performing endodontic procedures. Specifically, he addressed the notion that chlorhexidine (CHX) is appropriate as the sole irrigant.

"All irrigating solutions are reasonably effective in washing, reducing friction (i.e., lubricating instruments) and balancing against a rise in temperature," wrote Haapasalao in the *Journal of the Canadian Dental Association*. "The important differences between products are related to their ability to dissolve tissue and kill microbes, two key areas."

Because CHX has no tissue-dissolving effect, its use as the main or only root canal irrigant cannot be recommended, he said.

"Even if (in theory) all bacteria were killed by CHX, the canal walls would be covered by a smear layer and organic debris including biofilms, which would not allow an adequate seal between the sealer-root filling and the canal wall dentin," he said.

Haapasalao said the irrigants of choice during endodontic procedures are sodium hypochlorite (NaOCl) continuously during instrumentation followed by a two-minute rinse with ethylene diamine tetraacetic acid (EDTA). And when maximal antimicrobial effect is desirable, CHX is the best choice as a final rinse after EDTA.





### Keeping Overhead to a Minimum

Graduates at the nation's dental schools enter into their professional lives with a solid backing in the art and science of dentistry. They can diagnose and treat dental disease, treat routine and complicated cases, and refer cases beyond their scope to more appropriate specialists. But students may be lacking in business acumen crucial to maintaining a healthy dental practice.

In an issue of the *American Student Dental Association News*, Jeffrey Dalin, DDS, a St. Louis dentist in practice for 30 years, and a noted expert in dental economics, responded to a reader's question about how to keep overhead at a minimum.

"Learning the business end of your dental practice is an ongoing task," Dalin said. "Be a constant student in this area."

It is estimated that fewer than 20 percent

of dentists surveyed know the financial health of their practices, said Dalin. On average, overhead as a percentage of practice revenue runs to 62 to 65 percent. But keeping overhead low can be more complicated than just attempting to reduce obvious costs.

"Don't think you should get rid of a good staff person so that you can hire a less-expensive, less-experienced person," said Dalin. "That experienced staff person actually saves you money with his or her abilities and how they work with you." The same advice goes for dental labs and materials: less-expensive services and products may cost you money in the long run.

Look at your income stream as a way to reduce overhead percentage, he said. Sometimes, increasing production or introducing new procedures into the practice can improve income.



**"It's exciting to be able  
to promote mouth health  
as a routine part of  
school health care."**

**BETH TRUETT,  
PRESIDENT AND CEO,  
ORAL HEALTH AMERICA**

### Oral Health America Partners With National Assembly on School-Based Health Care

Oral Health America's Smiles Across America Product Donation Project has teamed up with the National Assembly on School-Based Health Care (NASBHC). OHA's Product Donation Program will donate 5,000 units of fluoride varnish to 20 school-based health centers across the United States.

Kaiser Permanente, through its employee-wellness program Healthy Workforce, awarded a grant to NASBHC to fund technical and financial assistance to school-based health centers to incorporate oral health promotion, assessment, and preventative practices within well-child visits.

"We are so pleased to be able to support this effort with the donation of Vella 5% Sodium Fluoride Varnish with Xylitol from Preventech" said Beth Truett, president and CEO, Oral Health America. "It's exciting to be able to promote mouth health as a routine part of school health care."

Through Healthy Workforce, Kaiser contributed \$50 for each employee who took an online health risk assessment. Al-

most 23,000 Kaiser Permanente employees participated in the program, which raised \$1.2 million overall.

"One of the most pressing, unmet health needs of children and adolescents that SBHCs seek to address is oral health," said Linda Juszczyk, executive director of NASBHC. "We're excited to offer technical assistance and training to such a diverse group of SBHCs so that they can address these difficult challenges and keep students healthy and learning."

Grantees were trained on how to administer fluoride varnish during the NASBHC annual conference in Chicago last June.

"We believe in early detection, preventive dental care, and that good oral health allows for good overall health," said Al King, president and CEO of Preventech. "That is why we have partnered with Oral Health America's Product Donation Program. We are proud to support OHA's work around the country and the work of the National Assembly of School-Based Health Centers."



## Increased Hookah Use by Young Adults, Athletes

In the United States, cigarette smoking is on the downswing. But before we start rounds of high-fives, use of other forms of tobacco, especially among young college-age students, including athletes, is on the uptick. And hookah is part of that scene.

Many hookah users may believe their mode of smoking is less harmful than cigarettes. K. Vendrell Rankin, DDS, professor and associate chair in the Department of Public Health Sciences at Baylor College of Dentistry, disagrees and documented her findings in a recent issue of the *Texas Dental Journal*.

"Although the quality of evidence for the different outcomes varies," she said, "the results of a systematic review of the available evidence on hookah smoking found a significantly increased risk for lung cancer, respiratory illness, low birth-weight, and periodontal disease."



Additionally, secondhand smoke from a single hookah session contains approximately four times the carcinogenic polycyclic aromatic hydrocarbons, four times the volatile aldehydes, and 30 times the carbon monoxide of a cigarette. Furthermore, some experts, including the World Health Organization, warn that communal hookah smoking presents a risk for the transmission of communicable disease.

## Ways to Improve Patient Understanding and Compliance

When patients fail to understand your instructions, or simply forget (or ignore) postprocedure home care, the result can range from potentially annoying to downright dangerous, especially if the instructions are dealing with medication.

There are some strategies dentists can undertake to better ensure patient understanding and compliance, wrote Kathleen Roman in an issue of *KDA Today*, the publication of the Kentucky Dental Association.

Among them, Roman said:

- Conduct a random chart audit. Look for documentation of patient non-compliance. When you find it, look for notes that the patient was given education materials. You may find a correlation between noncompliance and a lack of educational materials.

- Establish a system to secure a signed informed consent form from patients for many procedures. The educational process that goes with an informed consent policy should provide patients

with enough education to be able to make an appropriate treatment decision.

- Determine who in your practice is engaging in patient education. While few states allow anyone but a dentist to make a diagnosis, your hygienist is an ally in terms of educating patients about their oral health, especially their home oral health regimens.

- If more than one dentist practices in the same office, make sure you're using the same educational materials for patients. Inconsistency can lead to errors.

- Make sure your materials are up-to-date. Periodically review what you give to patients. As dentistry changes and as your practice changes, these materials should be updated. (The ADA provides members with educational materials.)

- When conveying important information to a patient start by explaining why it's necessary. Second, try not to use complicated language. Gum disease is fine for periodontitis. Third, engage the patient to make sure he or she understands the instructions you have provided, going back over the information if necessary.





### It Takes Perseverance to Go Paperless

Despite advancements in software and technology, the hurdles associated with making a health care practice paperless can be challenging, said Garrett Guess, DDS, in an issue of *FACETS*, the journal of the San Diego County Dental Society.

While the records management program you use might be up to par, and your staff competent, one might run into problems dealing with older patients or patients who otherwise might have missed the “technology train,” said Guess.

“As a fan of technology, and having the ability to create my own software to adapt to the needs of my practice and patients, I still have significant difficulty keeping paper out of the practice when it comes to treating a wide variety of patients,” Guess said.

To deal with the vast amount of paper

your patients might bring in to your office — insurance documents, prescription lists, referral slips — it might be a good idea to invest in a high-quality scanner.

Guess also recommends getting rid of paper forms that patients use for data entry like new patient registration and medical history questionnaires. A computer or even an iPad — or similar tablet device — handed to a patient can reduce paper. But the time factor could be a problem with older patients who may take up to 30 minutes filling out a form on a screen.

The bottom line is that your patients’ familiarity with various forms of technology remains a significant hindering factor to your becoming a true modern, high-tech office. However, while you may have to put up with some paper documents, getting closer to the paperless office is possible by using a good scanner and by offering computer or web-based forms for those patients familiar with such technology.

### Tips to Improve Your Practice’s Search Engine Ranking

The May issue of the *MSDA Newsletter*, the publication of the Maryland State Dental Association, offered tips to readers for achieving top search engine rankings for their practices.

First, develop a website as the cornerstone of your marketing strategy. Include keyword-rich content, new patient forms, appointment request pages, easy navigation, and patient education. These things will make your site more attractive and will increase your ranking.

Second, optimize your website for local search. Search engines use complex algorithms when determining which sites rank at the top of the page for specific keywords, so hiring a third-party dental search expert may be a good option to ensure your site achieves a high natural search ranking. Your strategy should include keyword identification and analysis; keyword-rich content; quality link building; place page set-up and verification; local directory submissions; and patient reviews.

Third, keep your website fresh. Content that is regularly updated, timely, and relevant is a key to online practice success. Regular updates can help ensure a higher ranking in search engine returns.





## Oral Health as 'Leading Health Indicator'

A subcommittee of the Human Health Service's Advisory Committee on National Health Promotion and Disease Prevention Objectives voted recently to recommend oral health as one of 14 "leading health indicators" (LHIs) for the full-scale implementation of Healthy People 2020.

This is extremely important because the LHIs are used as guidelines for the government when it considers how public, private, and nonprofit health resources should be prioritized over the coming decade, according to a press release.

The subcommittee made its recommendation one day after receiving a letter from the ADA urging that oral health be included as an LHI.

This development indicates a positive advance for oral health issues. However, HHS still has to act on the committee's recommendation.



### PRACTICAL MORALITY, CONTINUED FROM 691

had submitted an estimated \$6 billion in fraudulent claims.

Is there an acceptable level of corruption? Of course there is, and we are all experts at detecting it. I would be happy to hear refutations of this claim from anyone who has never once driven over the speed limit, told a lie, or encouraged a patient to undergo a procedure they did not really need.

Fortunately there is a definable level of practical morality between ethical anarchy and abstract ethical perfection. In fact, the Nobel laureate John Nash, about whom the movie *A Beautiful Mind* was made, proved that there is such a practical but not perfect level in every situation. This can be defined very precisely in mathematical terms if one wants to take the trouble. But most often we sense intuitively what a society will accept in terms of minor indiscretions and when we have crossed the line. We are creatures of practical moral common sense. In technical terms, this optimal practical fair point in human relations is called the "equilibrium": a point where each of us can expect nothing better from everyone, including ourselves.

Editorials, sermons, things we tell our children, and hypocrisy are all about

perfection. There are two reasons why there is always a gap between perfection and the general moral behavior in a community. First, there has never been agreement about how to define moral perfection. Second, perfection is not humanly sustainable.

This is not a discussion about moral relativism. Anyone who cheats in the game of life, anyone who attempts to get more than his or her fair share at the expense of others by distorting the rules of the communities should be punished. They are immoral. Anyone who tries to live in that zone between the value of the game and perfection has my complete admiration. But I don't expect to be lectured to by them.

The nub:

- ❶ Don't mistake preaching about perfection for being moral in a practical sense.
- ❷ Always prefer accepting the flawed nature of others to hypocrisy.
- ❸ Judge the adequacy of moral behavior by this rule: Have I made all the improvements in the world that were available to me?

*David W. Chambers, PhD, is professor of dental education, Arthur A. Dugoni School of Dentistry, San Francisco, and editor of the Journal of the American College of Dentists.*



### Gluma Desensitizer PowerGel



Gluma Desensitizer PowerGel, a unique one-step desensitizing gel formula, provides comfort to patients by eliminating or preventing postoperative hypersensitivity. Its new formulation allows for accurate control during application and is ideal for cervical erosions, exposed dentin surfaces and gingival recession that hygienists may encounter during a prophylaxis. This new product can also be used by dentists and assistants under crowns, bridges,

inlays, onlays, veneers, temporaries, and all direct restorations. Gluma Desensitizer PowerGel combines the same level of effectiveness and desensitization as Gluma Desensitizer with the added benefits of better handling, easier control, and greater accuracy during application. For more information, visit [heraeus-dental-us.com](http://heraeus-dental-us.com) or call 877-431-1785.



### Flor-Opal Varnish White



Ultradent has released Flor-Opal Varnish White, a fluoride varnish delivered through its new mess-free SoftEZ tip. The innovative syringe and tip delivery system applies an even coat of varnish from start to finish with a fast, easy paintbrush-like application. Flor-Opal Varnish White's unique features include bristles that are integrated within the body of the tip and a

unique syringe-to-syringe mixing system, allowing for a smooth, consistent dose of fluoride to each tooth. The flexible syringe provides ease in reaching difficult-to-access areas. Flor-Opal Varnish White is available in bubblegum and mint flavors. For more information, call 800-552-5212.



### No Reported Errors as UCSF Phases in New Robotic Pharmacy

During the phase-in period of the University of California, San Francisco, Medical Center's robotic pharmacy, "not a single error has occurred" in which 350,000 doses of medication were prepared using this new automated hospital system.

These giant robots now count and process "even their most complex oral and injectable medicines, including toxic chemotherapy drugs," according to a news release. It is believed to be the most comprehensive automated pharmacy in the nation.

"The automated pharmacy streamlines medication delivery from prescription to patient," said Lynn Paulsen, PharmD, director of pharmaceutical services at UCSF Medical Center. "It was important to develop a system that is integrated from end to end. Each step in safe, effective medication therapy — from determining

the most appropriate drug for an individual patient to administering it — is contingent on the other."

Using robotic technology and electronics to prepare and track medications is helping UCSF with its goal of improving patient safety. The automated system prepares oral and injectable medicines, including toxic chemotherapy drugs. In addition to providing a safer environment for pharmacy employees, the automation also frees UCSF pharmacists and nurses to focus more of their expertise on direct patient care.

The new pharmacy serves UCSF hospitals at Parnassus and Mount Zion, and has the capacity to dispense medications for the new UCSF Medical Center at Mission Bay, which is scheduled to open its doors in 2014. Additional steps in the process will be eliminated as doctors begin inputting prescriptions directly into computers in 2012.

"We are intent on finding new ways to improve the quality and safety of our care, while increasing patient satisfaction," said Mark Laret, CEO, UCSF Medical Center and UCSF Benioff Children's Hospital. "The automated pharmacy helps us achieve that and at the same time, advance our mission as a leading teaching hospital and research institution."

Bar coding and computerized physician entry, as well as changes in hospital processes for medication management, can help reduce errors, according to technology studies. The pharmacy also will enable UCSF to study new ways of medication delivery with the goal of sharing that knowledge with other hospitals across the country.

Here's how it works: Once computers at the new pharmacy electronically receive medication orders from UCSF physicians and pharmacists, the robotics pick, package, and dispense individual doses of pills. Machines assemble doses onto a thin plastic ring that contains all the medications for a patient for a 12-hour period. The medications then are bar coded. Nurses at UCSF Medical Center soon will begin to use bar code readers to scan the medication at patients' bedsides, verifying it is the correct dosage for the patient.

#### UPCOMING MEETINGS

##### 2011

Oct. 10-13	ADA 152nd Annual Session, Las Vegas, <a href="http://ada.org">ada.org</a>
Oct. 23-26	National Primary Oral Health Conference, National Harbor, Md., <a href="http://nnoha.org/conference/npohc.html">nnoha.org/conference/npohc.html</a>
Nov. 6-12	United States Dental Tennis Association, Palm Desert, Calif., <a href="http://dentaltennis.org">dentaltennis.org</a>
Dec. 16-17	First Dental Conference, Scientific Dental Committee at the Palestinian Dental Association in Lebanon, Beirut, Lebanon, 916-780-1955

##### 2012

March 29-April 1	CSPD/WSPD Annual Meeting, Portland, Ore., <a href="mailto:drstewart@aol.com">drstewart@aol.com</a>
April 22-28	United States Dental Tennis Association's 45th Annual Spring Meeting, Kiawah Island, S.C., <a href="http://www.dentaltennis.org">www.dentaltennis.org</a> or 800-445-2524
April 26-28	World Federation for Laser Dentistry, 13th Annual World Congress, Barcelona, Spain, <a href="http://wfldbcn2012.com">wfldbcn2012.com</a>
May 3-5	CDA Presents the Art and Science of Dentistry, Anaheim, 800-CDA-SMILE (232-7645), <a href="http://cdapresents.com">cdapresents.com</a>
Oct. 18-23	ADA 153rd Annual Session, San Francisco, <a href="http://ada.org">ada.org</a>

To have an event included on this list of nonprofit association continuing education meetings, please send the information to Upcoming Meetings, CDA Journal, 1201 K St., 16th Floor, Sacramento, CA 95814 or fax the information to 916-554-5962.



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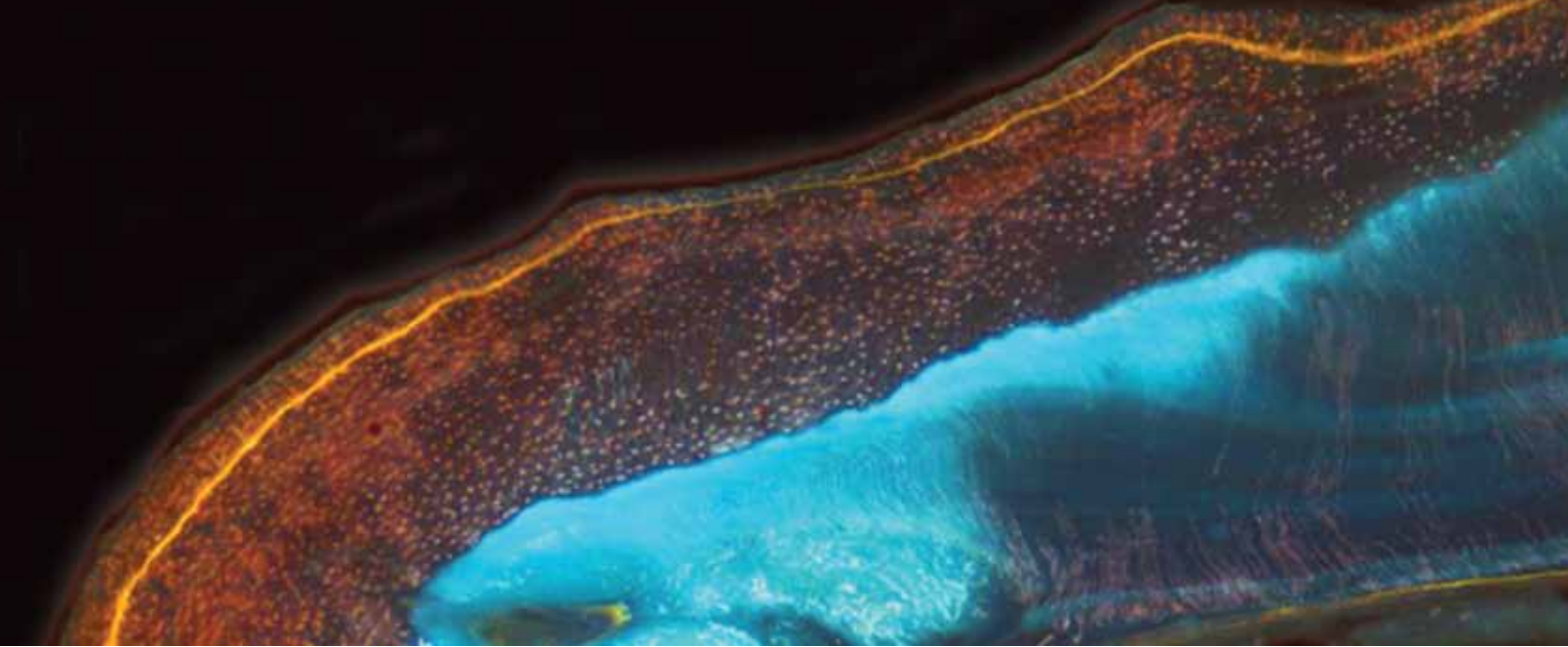


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# Advancing the Practice of Dental Disease Management

ROLANDE LOFTUS, MBA

In a continued effort to promote caries management by risk assessment, the CDA Foundation hosted a symposium in January 2011 to advance the practice of dental disease management by engaging researchers, clinicians, insurers, and policy-makers in a practical discussion on caries management, the impact of caries on access to care, and financial implications and current policies that inhibit widespread adoption of the protocols.

## GUEST EDITOR

**Rolande Loftus, MBA,** is a program director, California Dental Association Foundation, in Sacramento.

The goal of the conference was to disseminate research findings that support comprehensive change in the delivery and financing of preventive dental care by educating and gaining the support of professional organizations, policy-makers, and insurers. It was designed to provide a forum to address the barriers to widespread adoption of a disease-management model in clinical dental practice from different points of view. A multidisciplinary panel of experts presented recent research findings and trends in their assigned topic area, and were followed by reactors to support or challenge the presentation's content. Each panel session concluded with open dialogue between the audience and presenters and the collection of written feedback. Presenters and reactors met in private session to discuss audience feedback that then was incorporated into the articles that make up this two-part issue.

This month, articles are focused on new research findings validating the use of risk assessment in managing caries and outlining the challenges and opportunities that exist when attempting to implement this practice philosophy in practice. Readers also will

learn about updated protocols for pediatric patients, and understand the role of communication between provider and patient and how to motivate patients to adopt healthy behaviors. The final article in this issue is the result of a strengths, weaknesses, opportunities, and threats analysis of caries management by risk assessment to identify strategies to overcome some of the weaknesses and threats to widespread adoption of CAMBRA principles and treatment protocols, while taking advantage of its strengths and opportunities.

Next month will feature articles from practitioners, payers and private philanthropy outlining each party's role in bringing about change and their own experiences with implementation of CAMBRA protocols in practice. ■■■■



# Translating the Caries Management Paradigm Into Practice: Challenges and Opportunities

MARGHERITA FONTANA, DDS, PHD, AND MARK WOLFF, DDS, PHD

**ABSTRACT** In an era of evidence-based care, the question of how much evidence is needed to implement changes into practice becomes central to dentistry's recognition that dental caries management must change to a focus on risk-based, patient-centered disease management rather than just restorative care. This article reviews some of the opportunities, needs, and challenges involved in the adoption and implementation of caries management strategies into everyday clinical practice.

## AUTHORS

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In 2002, the journal *Science* published a special issue called, "The Puzzle of Complex Diseases." Although they used type II diabetes, lupus, and schizophrenia to illustrate the challenges of managing "complex" diseases, they could have very well used dental caries as a relevant example. "Complex" diseases were defined as those which arise from the combined action of many genes, environmental, and/or infectious factors, and risk-conferring behaviors.<sup>1</sup> Dental caries is a "complex" disease. It is the localized destruction of susceptible dental hard tissue by acidic byproducts from bacterial fermentation of dietary carbohydrates.<sup>2</sup> It is a generally chronic, site-specific, multifactorial, dynamic disease process that involves the shift of the balance between protective factors (that aid in remineralization) and destructive factors (that aid in demineralization) to favor demineralization of

the tooth structure over time.<sup>3</sup> Furthermore, even while dental caries is a largely preventable disease, it is still the most prevalent chronic disease of childhood.<sup>4</sup>

Untreated dental disease results in pain, loss of tooth structure, and infection of periodontal tissues, with lasting effects on function, growth, and development. "Complex" diseases, because of their "multifactorial" etiology, are very difficult to manage and treat. In fact, it has been argued that "complex" diseases should be managed by multidisciplinary and interdisciplinary teams. Accordingly, using new models of oral health care involving expanded partnerships with the medical community (e.g., pediatricians, nurses, etc.) is one of the most promising, necessary, and long-overdue strategies for reducing the large disparities in dental caries experience that exist among this country's young children.<sup>5,6</sup>

Furthermore, targeted health care

delivery has become paramount in an environment of increasing health care costs and resource constraints. Thus, one of the greatest challenges facing biomedical researchers today as it relates to “complex” diseases, including dental caries, is to better define how contributing factors interact in a way that translates into cost-effective strategies for disease diagnosis, prevention, and management.<sup>1</sup> What we do understand, however, is that restoring caries lesions as the only strategy for caries management is not the solution. Restoring caries lesions places a tremendous economic burden on society and provides no likelihood of preventing future disease. Most importantly, the fact that the existence of recent restorations is one of the greatest indicators of risk for the development of new caries lesions only proves that the act of surgically treating the caries lesion does little to reduce the risk of developing the next lesion, and generally makes no significant difference to bacterial loading, nor on the enactment of self-promoting health behaviors such as brushing one’s teeth.<sup>7-10</sup> In fact, risk-based prevention and patient-centered disease management have been recognized as the cornerstones of modern caries management.<sup>11,12</sup>

Modern caries management emphasizes a preventive philosophy, with individualized risk assessment and disease management, accurate and early detection of caries lesions, and efforts to remineralize noncavitated lesions in order to minimize operative intervention. When operative intervention is unequivocally required, typically for an active cavitated lesion, the procedure used should be as minimally invasive as possible while considering the patient as a whole to achieve the best long-term results. Some have referred to this strategy as “minimally invasive dentistry,” yet shouldn’t

all “modern” dentistry be “minimally invasive”?<sup>3,13</sup> Lastly, risk-based clinical decision-making for caries management in everyday clinical practice should be based on the best available evidence while taking into account the dentist’s knowledge and expertise and focusing on the needs and desires of the patient.<sup>14</sup>

Because of the multifactorial nature of the dental caries disease process, and the fact that the disease is very dynamic (e.g., lesions can progress and/or regress), risk-based caries management tends to

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be complex, with a multitude of variables challenging the prediction and treatment decision-making process at different times during the life of an individual.<sup>15</sup> In the last few decades, there has been a renewed interest in cariology, which has led to many advances and changes in the availability of evidence-based information, caries detection tools and criteria, disease diagnostic tools, risk assessment tools, and management products available for clinical use. The strength of the evidence behind these strategies and products varies, so clinicians are left to wonder what to adopt and how best to adopt it. In addition, advances in adhesive dentistry have also allowed for research findings that challenge our understanding of what invasive management of caries lesions should look like. For example, numerous sys-

tematic reviews question the amount of carious tissue that must be removed, with some reviews suggesting that sealing lesions can effectively reduce their progression and can reduce the numbers of microorganisms in them, with other reviews suggesting that removal of all infected dentin is not required for success, and that partial caries removal is preferred to reduce the risk of pulp exposure.<sup>16-19</sup>

Advances in cariology will keep influencing our practice of dentistry in the future. For instance, from a biological perspective, we now have a number of genes that have been identified in relation to tooth development, salivary function, and diet/taste that may contribute to caries risk or protection.<sup>20</sup> This opens the possibility that cariology may one day join the movement toward personalized medicine powered by salivary diagnostics. The question that remains to be answered is whether this knowledge will translate into better targeting of specific interventions for caries management that would improve the oral and/or the general health of at-risk populations.

But as exciting as all these changes and possibilities for caries management in clinical practice are, one of the major barriers in the translation of caries detection, assessment, diagnosis, risk assessment, and management findings from the research domain to everyday clinical practice is the confusion around the variety of terms clinical dentistry, education, and research choose to use when referring to dental caries (e.g., early lesion, incipient lesion, decalcification, watch, white-spot lesion, noncavitated lesion, cavitated lesion, enamel lesion, dentin lesion, etc.). This is important not only for translation of research findings to practice and for communications between clinicians to accurately take place, but it is also essential for accurate communication with patients.

Several consensus development conferences, committees, and dental organizations have addressed this problem in recent years by debating and developing definitions which reflect up-to-date evidence in relation to various specific key aspects of caries.<sup>23</sup> However, in spite of the evolution in our understanding of the caries disease process and the exciting advances described previously, we face many additional challenges to translate these findings into practice. Some of these challenges will be discussed next, as they represent opportunities for change.

## Challenges and Opportunities

### *A Change in Paradigm for Caries Classification System, Caries Activity and Risk Assessment*

G.V. Black recommended an examination technique that started with the removal of surface deposits, utilizing three explorers, and a mouth mirror in a methodical process to “reveal the beginnings of decay anywhere.” He then developed a caries classification system, classes I through V, depending on the surface(s) involved, that defined how we spoke (and some still speak) about dental caries for more than a century.<sup>21</sup> He stated, “This classification is especially intended for use in technical procedures.”<sup>21</sup> However, we must remember that the therapeutic modalities for dental caries available in 1900 were extremely limited. There was only one bullet available: restoration; no fluoride, no remineralizing technologies, and no sense that dental caries was a reversible event. In fact, Black’s amalgam formulation, cavity preparation, and restorations were the most-effective, evidence-based strategies available at the time for caries management, and, therefore, his caries classification system made perfect sense.

However, as we have discussed previously, today, it is recognized that dental caries is a dynamic process fluctuating between demineralization and remineralization over time.<sup>11</sup> It is the net gain or loss of mineral over time that determines whether caries lesion cavitation eventually occurs. The recognition of the dynamic nature of the caries disease and the strategies currently available for noninvasive caries lesion management mandate that the classification of caries lesions be descriptive and specific enough to

## THE NEED TO TRACK the location and activity mandates the development of additional classification systems for recording caries lesions.

allow monitoring and assessment if the lesion advances over time (with advancing severity of the lesions being de facto evidence of ongoing disease activity). Thus, in an era of nonsurgical as well as minimally invasive surgical treatments, it is necessary to carefully document the location and activity of both early and advanced carious lesions. The need to track the location and activity mandates the development of additional classification systems for recording caries lesions.

In 2002, a group of cariologists proposed the International Caries Detection and Assessment System (ICDAS) based on a nonexplorer visual examination. The ICDAS system was revised in 2003 to what is currently referred to as ICDAS II criteria.<sup>22</sup> The system is a seven-category classification of dental

caries lesions based on a visual identification of both wet and dry surfaces with no use of the sharp explorer. Originally, it was designed for application on the occlusal surface, but its use has been expanded for utilization on all surfaces. Studies conducted to determine the accuracy of the system in predicting the penetration of caries lesions into dentin found histologic validity of the ICDAS system.<sup>23,24</sup> Furthermore, the ICDAS system, when combined with adjunctive diagnostics such as radiographs and fiber optic transillumination (FOTI), permits the monitoring and nonsurgical treatment of early carious lesions. When combined with the determination of lesion activity, as indicated by plaque accumulation, gingival redness and loss of surface luster, as well as a patient’s caries risk, an ideal treatment regimen can be determined.<sup>25</sup>

Modern caries management thus mandates the adoption of a uniform methodology for practitioners to record the location, extent of penetration of the lesion (severity), and the activity of the lesion utilizing visual and other assessment technologies, such as light (e.g., visible, fluorescent, reflective), electrical conductivity, and radiology, amongst others, as these technologies develop. A uniform charting system will enable the monitoring of nonsurgical management of the early carious lesion, unbound by the constraints of the earlier Black classification system.

Regarding caries risk assessment, it is an essential component in the decision-making process for the correct prevention and management of dental caries. Multiple risk factors and indicators have been proposed as targets in the assessment of risk of future disease, varying sometimes based on the age group at which they are targeted. Multiple reviews



and systematic reviews are available in the literature on this topic, and they demonstrate that there is a strong body of evidence to support that past and present caries experience is still, unfortunately, the single-best predictor for future caries development.<sup>7,8</sup> In young children, prediction models, which include a variety of risk factors, seem to increase the accuracy of the prediction while the usefulness of additional risk factors for prediction purposes, as measured until now in the literature, is at best questionable in schoolchildren, adolescents, and adults.<sup>15</sup> That is not to say these additional factors should not be assessed to help understand the strength of their associations with the disease experience in a particular patient, and aid in the development of an individualized and targeted caries preventive and management plan.

In addition, a dentist's overall subjective impression of the patient has a relatively good predictive value for caries risk, but it is unclear how this information is incorporated into everyday clinical practice.<sup>26</sup> A recent survey of clinical practices within a U.S. Practice-Based Research Networks suggests that a significant proportion had yet to adopt treatments based on assessment of caries risk.<sup>27</sup> Thus, a more objective, easy-to-implement, and validated risk assessment instrument is desirable, and this is reflected in the multiple risk assessment tools that have been developed during the last few years. Examples for adults include the American Dental Association's Caries Risk Tool for adults, a caries risk form published in October 2007 in the *Journal of the California Dental Association* for adults, and the cariogram.<sup>28-30</sup> Tools like these need to be incorporated into everyday clinical practice to help guide the type and intensity of patient-centered caries management strategies to be used.

### *Finding the Best Evidence-Based Information for Dental Caries Detection, Diagnosis, Risk Assessment, Prevention and Management*

How much evidence is needed to start making changes in our practice of dentistry? In the majority of countries, unfortunately, teaching and practice has remained focused on the consequences of the caries disease (e.g., restorative dentistry). In fact, the profession is focused on repairing the consequences of the caries disease rather than maintenance of health, and thus we

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are procedure-based, not diagnostic-based in our reimbursement schemes. Unfortunately, this is also how the public perceives us. The definition of a dentist in a first-grade textbook was disease-based, "A person who is trained to examine and fix teeth." This is in contrast to the health-based definition of a doctor, "A person who is trained to help people stay healthy."<sup>31</sup> It is clear that in order to change the focus of the profession toward understanding the evidence behind modern caries management strategies and focus on maintaining health, there is a need to improve dissemination of information and communication between research, education, and practice in order to accelerate adoption of validated approaches for the diagnosis and management of dental caries disease.<sup>32</sup> In fact, education can help bridge the gap between research and practice.<sup>33</sup>

Those who have never utilized evidence-based principles in their career become quick devotees to say there is inadequate "evidence" as an excuse against change. And it is true that evidence for many of our daily caries disease intervention choices should be much stronger, and that many reviews conclude the evidence is weak. Opponents of the risk-based strategy for caries management maintain that it is difficult to accurately identify caries at-risk patients, and that even if we could, the evidence on preventive measures for high-risk individuals is still not very strong. All of this is in part true; however, the authors contend that when the well-being of the patient is considered, it is more important to carry out a risk-based caries management incorporating the best available evidence than just doing nothing due to lack of strong evidence. Others allege that similar caries preventive measures should be administered to the whole population, regardless of the risk. However, for the current environment of increasing health care costs and resource constraints, targeted health care delivery has become paramount, depending profoundly on risk assessment. If a clinician practices in an environment in which all patients have a similar risk of caries, then we agree that doing individual risk-based management would add no value to the clinician or the patient. However, dental caries is unequally distributed: A small percentage of individuals carries the heavier burden of caries disease.<sup>34</sup> For most dentists in private practice it then becomes imperative to be able to identify a patient's risk status in order to be able to develop the most cost-effective caries treatment strategy for that individual.

Thus, what can be safely incorporated into practice and how? If evidence challenges and questions current clinical

practice, it will affect implementation. In addition, maintaining an evidence-based knowledge on every aspect of dental practice can be an overwhelming task; the volume of information is substantial, frequently difficult to locate, difficult to separate appropriate science from unreliable information and information can be contradictory. Furthermore, clinicians have not been traditionally trained to critically search, evaluate, and incorporate research findings and best evidence into their everyday practice model.<sup>35</sup> That is why dental schools, continuing professional education, and organized dentistry have very important roles in helping clinicians make sense of available evidence, either through educating practitioners in the techniques of evidence-based dentistry or in providing repositories of best practices based on sound evidence.<sup>36</sup> For example, some of the highest levels of evidence and strongest recommendations can be found for fluorides and sealants.<sup>37,38</sup> Thus, it is critical that caries treatment guidelines and individualized caries management strategies include these proven effective strategies.

Furthermore, when considering the incorporation of newer strategies that seem promising but for which the level of evidence supporting them is lower, we should use them to supplement well-known interventions, rather than substituting them. If dentistry does not develop appropriate evidence-based guidelines, these interventions may be incorporated in practice in a random, disorganized, and possibly incorrect manner. However, even in practices using risk-based prevention of caries, fluoride is often not used in an optimal manner. For example, Bader et al. reported that in a group of 15 volunteer private practices using risk-based prevention of dental caries, fluoride intervention modalities were only used in 63 percent

of identified high caries risk patients and 32 percent of identified moderate caries risk patients.<sup>39</sup> This is in contrast to ADA recommendations published in 2006 for in-office topical fluoride applications.<sup>37</sup> Bader et al. found practices very willing to perform caries risk assessment and caries risk-based prevention, and concluded this was indeed a feasible approach in practice today. However, they called for “more intensive exposure to fluorides in preventive treatment for patients at elevated risk of developing caries.”<sup>39</sup>

**EVEN IN PRACTICES  
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#### *Need for Clinician Training*

Having access to the best evidence is not enough to change the practice model of caries management. Lack of training and calibration can have devastating effects on any clinical and educational program, especially when the program is trying to teach clinicians to manage a disease whose diagnosis and management paradigms have undergone the large shifts that have occurred within cariology and the treatment of caries disease. Dentists who had traditional training may view current efforts to manage caries disease with skepticism. Changing long historic norms/inertia related to traditional caries management is very difficult. Phrases such as “I’ve always checked for caries with an explorer; not to use it would

be malpractice” or “How do we charge for our time?” are sometimes encountered as responses to proposed risk-based management efforts in clinic.

A real challenge is how we assess an outcome (lack of caries lesions, caries remineralization, or arrest) that may not be tangible for a long time, as the disease is commonly very chronic. If the patient cannot relate the money spent to an item or procedure as they have traditionally done in the past, they may not value the service. In addition, where an evidence base does not exist, different opinions seem inevitable. In fact, great variations in diagnosis and outcome assessment in general dental practice have repeatedly been demonstrated and published, i.e., “when, in the caries process, restorative intervention is indicated?” Yet, few dental schools and clinical programs make a formal attempt to standardize/calibrate clinicians in clinical decision-making in restorative/conservative dentistry and/or preventive dentistry (and vice versa).<sup>40</sup>

Possible responses to this issue include the following: 1) increase the opportunities for clinician training and calibration through CE courses; 2) simplify the risk-based, decision-making process to help make the training process easier, which may include simplifying the forms or the information retrieval process; and 3) modify practice management systems to ensure that appropriate care is being provided to all patients. But the literature suggests that just passive dissemination of information is generally ineffective to affect change. This includes educational materials (recommendations for clinical care, including clinical practice guidelines, audiovisual materials, and electronic publications), and attending didactic educational meetings.<sup>41</sup> Therefore, active training programs have to be developed (and resources planned

and allocated) to educate practitioners in different aspects of modern caries management, including case discussions, hands-on training activities, etc.

### *Reimbursement (Productivity)*

Reimbursement of services, or lack of reimbursement, is often cited as a barrier to the rapid acceptance of certain advances in dentistry into practice. In fact, if no value is given to procedures or treatment philosophies, they will not happen. Thus, we cannot expect dentists to get rewarded only for operative care and still want to implement nonsurgical strategies for caries management. Currently, there is no good mechanism for rewarding dentists in keeping teeth healthy. Thus, there is lack of an economical model for the integration of modern caries management in a fee-for-service system. Huge resources are required to change the system for patient management, including record keeping, treatment planning, and delivery of clinical procedures. We need to value the time spent doing diagnosis and nonoperative management of the disease. But this means we also need diagnostic codes and risk-based reimbursement codes for many things we need to do for modern caries management, including risk-based recall visits. We need harmonization in terminology and caries classification that can facilitate a minimal intervention/prevention-oriented approach for caries disease management. But most importantly, we need an educated public that will request insurance programs that allow for risk-based, patient-centered caries disease management.

### *Standard of Care/Public Expectations*

Standards of care can sometimes change due to public need and expectations, and sometimes due to external or outside forces such as professional groups' influence and licensing requirements.

Undoubtedly, that management of dental caries using only a surgical model is outdated. An important engine for change is what patients expect and require.<sup>33</sup> And there is an increasing awareness of the desirability of healthier lifestyles and a growing skepticism among some groups about excessive invasive surgical aspects of Western medicine and dentistry.<sup>42</sup> Changes in medical practice to a more preventive and risk-based model forecast changes that need to occur in dental care

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and education. Some argue that the scientific basis for dental caries risk assessment is not absolute, but neither is the scientific basis for many of the surgical procedures done in dentistry.<sup>43</sup> Patients are questioning the need for invasive procedures and ask about nonsurgical strategies such as xylitol, chlorhexidine, and different kinds of fluoride. The Internet era in which we live exposes the general public to the abundance of research findings. Additionally, management of infections is not solely the purview of dentistry. If dentistry does not respond to the challenges and needs of the future, other health professionals will take advantage of the opportunities that new technology provides, such as using saliva as a diagnostic fluid and using the innovations offered for disease management.

## **Conclusions**

Even though there have been many advances in cariology in the last decades, teaching and practice have remained focused on the consequences of the disease. Some of the challenges to implementing a modern caries management include:

- We need to use caries classification systems that allow assessment of disease severity and activity for active monitoring of noninvasive caries management strategies. Caries management needs to be risk-based, and thus use of a caries risk assessment tool becomes critical in practice.

- Evaluating and maintaining evidence-based knowledge in cariology is difficult for busy practitioners. The profession needs to find better ways to educate the existing dental workforce.

- How do we incorporate new information into practice when evidence is limited? Search for better therapeutic approaches for the management of patients at risk for dental caries needs to continue, as does the search for stronger evidence for available treatment strategies/choices. Newer strategies should be used to supplement well-known evidence-based caries management strategies and not substitute them.

- We need financial models to support this paradigm shift: Reimbursement for diagnosis and risk-based nonsurgical caries management.

- Public expectations/standard of care: Is management of dental caries by nonsurgical means a standard of care or an expectation of the public? We need to educate the public.

Yet, even within the current challenges it is possible and we must expect change in practice. When evidence is limited, the clinician is left with two choices: continue using the outdated traditional restorative-only approach based on irreversible procedures, or utilize nonde-

structive risk-based caries management strategies using best scientific evidence available. The latter choice is the one the scientific community has been encouraging the profession to embrace. Successful examples of modern caries management in everyday practice are presented in this issue. Finally, we must remember that the goal of modern evidence-based caries management should be to always select the therapeutic option that is supported by the highest level of evidence, is applicable, feasible, and acceptable to the particular dentist-patient team. ■■■■

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# Validation of the CDA CAMBRA Caries Risk Assessment — A Six-Year Retrospective Study

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AND JOHN D. B. FEATHERSTONE, MS, PHD

**ABSTRACT** The present manuscript presents the results of a six-year retrospective study validating caries risk assessment in a caries management by risk assessment program in a large predominantly adult patient population seeking dental care. CRA was successful in accurately identifying patients at high caries risk. Caries risk assessment in a CAMBRA program is a good clinical tool for everyday dental practice.

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For many years, there has been a need for evidence-based information to assist dental practitioners in the diagnosis, detection, and management of dental caries.<sup>1-3</sup>

In 1995, the *Journal of the American Dental Association* published a supplement outlining caries risk assessment and describing how dentists should consider managing patients according to their risk of developing dental decay.<sup>4</sup> Since then, two caries risk assessment (CRA) approaches have been developed based on the specific needs of populations and individuals.<sup>5</sup> One method is the population approach developed within the field of epidemiology and public health. This approach is based on the identification and quantification of risk factors that significantly compromise the population's health, with intervention strategies that affect populations, like communal water fluoridation.

The second approach is based on the individual and includes the presence or absence of factors involved in the carious process like biological characteristics, personal and medical history, habits, and lifestyle. These variables inserted into statistical decision models predict the person's risk of disease over some future period. This CRA patient-specific approach has two objectives which are both fundamental: CRA is currently a necessary component in the practitioner's clinical decision-making process and CRA is an educational and motivational technique to encourage the patient to adopt a healthier, prevention-oriented lifestyle.

In 2002, a consensus conference was held in Sacramento, Calif., on the topic of "Caries Management By Risk Assessment" (CAMBRA).<sup>6</sup> The proceedings were published and are available online in the February and March 2003 issues of the



*Journal of the California Dental Association* ([cdafoundation.org/journal](http://cdafoundation.org/journal)). A CRA form was proposed based upon the known literature at that time.<sup>7</sup> The variables included in the CRA form were a combination of disease indicators, pathological and protective factors that were assumed to be able to be used in combination to assess overall caries risk and to guide therapy and treatment planning. Subsequently, the CRA form was modified, improved by a national working group called the CAMBRA Coalition, and this improved version was published in the *Journal of the California Dental Association* in October 2007 following a second symposium.<sup>8</sup> For purposes of this paper, the authors will refer to this form as the “CDA CRA form.” The form is reproduced in **TABLE 1**.

The disease indicators or risk predictors in this CDA CRA (**TABLE 1**) are markers that are indicative of a current or past carious process but they are not causative factors. The disease indicators are clinical observation that recognize the presence of, or a recent history of, the dental caries disease: visible cavities or radiographic penetration of the dentin, radiographic approximal enamel lesions, white spots on smooth surface and restorations during the last three years. They are recognized to be highly predictive in terms of development of future lesions, and that the caries disease process will continue in the future. Disease indicators, by themselves, give a good idea of the risk level; but they do not help the practitioner to understand why a patient has developed the disease and how to customize the treatment plan and the recommendations to be delivered.

The risk factors or pathological factors in the CDA CRA are described as variables related to the probability of occurrence and progression of the disease,

including existing lesions progression and the formation of new lesions. Some risk factors are part of the causal chain: medium and high mutans streptococci and lactobacilli counts, presence of visible heavy plaque on teeth, frequent snacking (greater than three times daily between meals), and inadequate saliva flow (by observation or measurement). Some others expose the individual to the causal chains: deep pits and fissures involved in plaque retention, recreational drug use leading to the reduction

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of the saliva flow, medications/radiation/systemic diseases recognized to be saliva-reducing factors, exposed roots, and orthodontic appliances that are both a hindrance to good oral hygiene and also plaque retention factors.

The protective factors in the CDA CRA are biological or therapeutic factors or measures that can collectively prevent the demineralization process, enhance remineralization, or offset the challenge presented by the pathological risk factors. The CDA CRA protective factors include adequate saliva flow (greater than 1 ml/min stimulated), fluoride (from drinking water, toothpaste, varnish, gel), antimicrobial rinses (0.12% chlorhexidine recommended use once a day for one week each month), xylitol (gum, 0.7 gm or lozenges, 1 gm

recommended to be used twice daily for moderate risk or four times daily) for high risk, and casein phosphopeptide and amorphous calcium phosphate paste (CPP-ACP) used twice a day, morning and at night. Use of any of the preventive products during the last six months are considered protective factors.

The CAMBRA protocols and CDA CRA form were introduced into the predoctoral dental clinics at the University of California, San Francisco, School of Dentistry in January 2003 on a pilot basis and fully implemented in July 2003.

The aim of the present study was to retrospectively evaluate the validity of CDA CRA as related to existing caries and to determine its predictive value for future caries.

## Methods

This study was conducted retrospectively using electronic data and paper charts from UCSF predoctoral dental clinic patients. The study population consisted of patients over the age of 6 who had a baseline CRA between July 1, 2003, and June 30, 2009. The project received the approval of the Committee on Human Research (the institutional review board) of UCSF.

Data from the CRA pilot study were obtained by chart review. Electronic CDA CRA data was extracted from the electronic health record software system (axiUm, Exan, Vancouver, British Columbia, Canada). All data were transformed for analysis. Methods used in this study followed the protocols developed in the authors' initial study.<sup>9</sup> In this study, initial CDA CRA data were obtained at either the comprehensive or periodic oral examination, with follow-up CDA CRA data obtained at a subsequent periodic oral examination. When available, bacterial testing results were also included in the data analysis.

TABLE 1

# Caries Risk Assessment Form — Children Age 6 and Over/Adults

Patient Name: \_\_\_\_\_ Chart #: \_\_\_\_\_ Date: \_\_\_\_\_

Assessment Date: Is this (please circle) baseline or recall

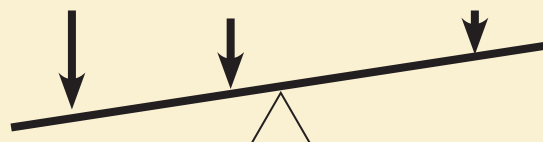
Disease Indicators (Any one "YES" signifies likely "High Risk" and to do a bacteria test**)	YES = CIRCLE	YES = CIRCLE	YES = CIRCLE
Visible cavities or radiographic penetration of the dentin	YES		
Radiographic approximal enamel lesions (not in dentin)	YES		
White spots on smooth surfaces	YES		
Restorations last 3 years	YES		
<b>Risk Factors (Biological predisposing factors)</b>		YES	
MS and LB both medium or high (by culture**)		YES	
Visible heavy plaque on teeth		YES	
Frequent snack (> 3x daily between meals)		YES	
Deep pits and fissures		YES	
Recreational drug use		YES	
Inadequate saliva flow by observation or measurement (**If measured, note the flow rate below)		YES	
Saliva reducing factors (medications/radiation/systemic)		YES	
Exposed roots		YES	
Orthodontic appliances		YES	
<b>Protective Factors</b>			
Lives/work/school fluoridated community			YES
Fluoride toothpaste at least once daily			YES
Fluoride toothpaste at least 2x daily			YES
Fluoride mouthrinse (0.05% NaF) daily			YES
5,000 ppm F fluoride toothpaste daily			YES
Fluoride varnish in last 6 months			YES
Office F topical in last 6 months			YES
Chlorhexidine prescribed/used one week each of last 6 months			YES
Xylitol gum/lozenges 4x daily last 6 months			YES
Calcium and phosphate paste during last 6 months			YES
Adequate saliva flow (> 1 ml/min stimulated)			YES
<b>**Bacteria/Saliva Test Results: MS: LB: Flow Rate: ml/min. Date:</b>			

## VISUALIZE CARIES BALANCE

(Use circled indicators/factors above)

(EXTREME RISK = HIGH RISK + SEVERE SALIVARY GLAND HYPOFUNCTION)

CARIES RISK ASSESSMENT (CIRCLE): EXTREME HIGH MODERATE LOW



Doctor signature/#: \_\_\_\_\_ Date: \_\_\_\_\_

To ascertain the validity of the CDA CRA form and its predictive value, descriptive and bidimensional analyses were performed using statistical software (SPSS 13.0). The  $\chi^2$  and McNemar-Bowker tests were used to test the relationship between CRA variables with a 5 percent level of significance. The odds ratios (ORs) were calculated to indicate the strength of the relationships as well as the direction. An OR less than 1.0 indicated a negative relationship (protective effect) with caries disease and an OR of more than 1.0 indicated a positive relationship with caries disease. When the OR was more than 1.0 the higher the OR the greater is the degree of relationship with caries disease.

## Results

### *Baseline CRA: Is the choice of the factors listed in the CDA CRA form relevant?*

Within the six-year inclusion period of the study, 12,954 patients had a baseline CDA CRA performed; 8,134 CRA were performed using forms from the 2003 CDA version and 4,820 using the 2007 CDA version, which is currently used at UCSF predoctoral dental clinics.

**TABLE 2** presents the demographic characteristics of the study population.

Students and supervising faculty were trained to make this “overall caries risk assessment” by taking into consideration the yes and no answers to the questions on this CDA CRA form and making a clinical judgment as to whether the caries balance swings toward the appearance of carious lesions in the future or whether the protective factors are likely to prevail, as described in detail previously.<sup>8</sup> The low and moderate risk determination was based on the number of protective factors and number of disease risk factors. Presence of any disease indicator auto-

matically determines high risk. Presence of any disease indicator plus dry mouth automatically determines extreme risk. An “overall caries risk” was determined by their providers for 10,957 patients based on the balance between disease indicators pathological and protective factors recorded in this CDA CRA form: 15.5 percent were classified as low risk, 21.9 percent as moderate risk, 60.5 percent as high risk and 2.1 percent as extremely high risk. Almost 55 percent of the patients included in the study had visible cavities or radio-

### THE LOW AND moderate risk determination was based on the number of protective factors and number of disease risk factors.

graphic evidence of caries penetration into dentin. Bacteria tests were performed, and the bacterial challenge was determined by visual comparison to standardized examples on a printed photographic sheet and recorded for 332 patients. The bacterial challenge for mutans streptococci was low for 46.1 percent and moderate or high for 53.9 percent of patients. The bacterial challenge for lactobacillus was low for 37.7 percent and moderate or high for 62.3 percent of patients. Based on risk status, patient-specific home treatment recommendations were given to 55.3 percent of the patients.<sup>10</sup>

Specific responses on this CDA CRA form were analyzed for their relationship to outcome variables of “visible cavitation” and “or caries into dentin by radiograph.” **TABLE 3** presents the  $\chi^2$  p-values, the ORs with 95 percent confidence

**TABLE 2**

### Demographic Characteristics of the Study Population (n=12,954)

<b>Gender</b>	Male: 47.7% Female: 52.3%
<b>Account type</b>	Cash: 58.9% General assistance (Denti-Cal and others): 27.4% Insurance: 13%
<b>Ethnicity</b>	Caucasian: 52.3% Asian: 16.1% African American: 12.2% Hispanic: 18.8% American Indian: 0.4%
<b>Birth Year</b>	1912-1994 Average 1958

intervals (CIs) of the disease indicators, the pathological and protective factors on this CDA CRA form. The largest odds ratio for disease indicators was 8.21 for the association of approximal enamel lesions on radiographs. The largest odds ratio for pathological factors was 2.55 for the association of visible heavy plaque. The strongest (significantly less than 1.0) odds ratios for protective factors were 0.81 and 0.80 for the negative association of fluoride toothpaste and fluoride mouthwash. The variables for which the high rate of missing data was more than 20 percent (appliances, saliva reducing factors and CaPO<sub>4</sub> paste) were not taken into account in the bidimensional analysis.

The cross tabulations between “visible cavitation” and “caries into dentin by radiograph” and the overall caries risk level at baseline are presented in **TABLE 4**. Percent cavitation increased as caries risk level increased. Patients were more likely to have cavities when the overall caries risk scores were determined as high (78.4 percent) and extreme (74.4 percent).

### *Follow-up CRA: Can the CDA CRA Form Be Considered as a Predictive Model?*

Among the 12,954 patients who had a baseline CRA between July 1, 2003, and June 30, 2009, 2,571 had at least one follow-up CRA that was performed (average 16+ 12.6 months after the baseline CRA).

TABLE 3

### Cross Tabulation “Visible Cavitation or Radiographic Penetration of the Dentin at CRA Baseline” Versus Disease Indicators, Pathological and Protective Factors at CRA Baseline (n=12,954)

		Visible Cavitation or Radiographic Penetration of the Dentin at CRA* Baseline		
		Significance ( $\chi^2$ p-value)	OR*	95% CI*
Disease indicators	Restorations last 3 years	<0.001	1.46	1.35-1.58
	Approximal enamel lesions on X-rays	<0.001	8.21	7.41-9.09
	White spots	<0.001	2.77	2.52-3.05
Pathological factors	Visible heavy plaque	<0.001	2.55	2.35-2.76
	Frequent snack	<0.001	1.77	1.63-1.93
	Inadequate saliva flow	<0.001	1.27	1.12-1.43
	Exposed roots	<0.001	1.19	1.10-1.28
	Deep pits and fissures	<0.001	1.80	1.63-1.98
	Recreational drugs	<0.001	1.95	1.66-2.28
Protective factors	Fluoridated community	0.011	0.85	0.76-0.97
	Fluoride toothpaste	0.003	0.81	0.70-0.93
	Fluoride mouthwash	<0.001	0.80	0.73-0.88
	Xylitol gum	0.103	0.86	0.72-1.03
	Chlorhexidine	0.724	0.95	0.73-1.24

\*CRA: caries risk assessment; OR: odds ratio; CI: confidence interval.

As shown in **TABLE 5**, “visible cavitation” and “caries radiographic penetration of the dentin” and “interproximal enamel lesions or radiolucencies” at follow-up were significantly related to overall caries risk at baseline. Of those assessed as high or extreme risk at baseline, the percent of patients who had new cavities at follow was 69.3 and 88 percent, respectively. “White spots” at follow-up were not significantly related to the overall caries risk at baseline.

## Discussion

The present retrospective study confirms the validity of the CDA CRA form developed by the Western CAMBRA Coalition and used at the UCSF and other dental schools since 2003.

Although Moss and Zero stipulated in 1995 that CRA approaches should be validated in everyday practice settings, most of the CRA surveys have been used under trial conditions and among populations of children or elderly

people.<sup>11,12</sup> This study presents CDA CRA outcomes among a population of older children and predominantly adults with a mean birth year of 1958 (median 1958, mode 1956). The current study was undertaken in a large educational clinical environment with multiple student providers and supervising faculty. There are more than 150 dental student providers and more than 50 supervising general dental faculty, with a large degree of variability providing care to this patient population. The majority of the supervising faculty are in general practice. It is expected the findings of this study will have generalizability to everyday clinical dental practice.

The preliminary study published in 2006 already had shown some strong relationships between the factors (disease indicators, pathological and protective) listed in the form and “visible cavitation or radiographic penetration of the dentin” at baseline, in a small sample of patients.<sup>9</sup>

The present results confirmed this relationship among the large patient sample. The preliminary study involved only 89 follow-up CRA appointments whereas the present study includes 2,571 follow-up CRA appointments.

All of the disease indicators and pathological factors identified on the CDA CRA form had statistically significant odds ratios greater than 1.0 (**TABLE 3**) showing positive relationship to the presence of cavitation or radiographic penetration into dentin at baseline. These results confirm the validity of using these indicators and factors in the risk CDA CRA form. For several of these disease indicators and risk factors, the odds ratios were much greater than 1.0 indicating a very strong relationship. Conversely, the protective factors each had odds ratios less than 1.0 (mostly statistically significant) and showed negative relationships to the presence of cavitation or radiographic penetration into dentin at baseline.

TABLE 4

### Cross Tabulation "Visible Cavitation or Radiographic Penetration of the Dentin" Versus "Overall Caries Risk Level" Both at Baseline (n=12,954)

Risk @ Baseline	Cavitations @ Baseline	P-value
Low	6.4%	<0.001
Moderate	25.2%	
High	78.4%	
Extreme	74.4%	

$\chi^2$  p-value <0.001 <0.001 0.163

TABLE 5

### Relationship "Assessed Overall Caries Risk" at Baseline Versus "Visible Cavitation or Radiographic Penetration of the Dentin," "Interproximal Enamel Lesions or Radiolucencies," and "White Spots" at Follow-Up (n=2,571)

Risk @ Baseline	First Follow-up Cavitations	Interproximal Lesions	White Spots
Low	23.6%	9.9%	10.2%
Moderate	38.6%	12.4%	7.7%
High	69.3%	28.7%	9.6%
Extreme	88%	23.5%	2%

$\chi^2$  p-value <0.001 <0.001 0.163

The high and extreme caries risk levels predicted by the use of the CDA CRA form were compared to outcomes in the 2,571 patients who were assessed at follow-up (TABLE 5), with 69 percent and 88 percent for high and extreme risk, respectively, returning with new cavities. Conversely, 76 percent classified as low risk returned with no cavities. These results demonstrate the predictive value of the CDA CRA form. Indeed, the caries risk score at baseline was highly significantly related to the presence of cavitation and radiographic penetration into dentin and approximal enamel lesions on X-rays at follow-up appointments.

The total number of patients classified as having caries risk was approximately 85 percent (21.9 percent moderate risk+60.5 percent high risk+2.1 percent extreme risk=84.5 percent).

(All of these caries risk patients should have received preventive treatment interventions, which would have provided increased protective factors and altered their caries balance more favorably.) However, only 55 percent of the 85 percent total at-risk patients were provided with specific home care recommendations that were captured using the electronic health record. In our experience, the majority of the patients who did not receive the preventive interventions were because of patient refusals, i.e., the patient did not want to purchase the preventive products. This may be due to providers not explaining the value of the prevention or simply patient financial reasons. It was impossible to know the extent of provider compliance in recommending to the patients the preventive interventions. The data

have not been analyzed to determine whether those who were provided with specific recommendations had less cavities, but, on the other hand, the data presented here show that the CRA procedures used were at least as good as 70 percent accurate, and based upon the extreme risk data, approximately 90 percent accurate even after 55 percent received treatment recommendations, which could have lowered the caries outcomes. In other words, if no treatment was given, the predictive value could quite possibly be even higher.

These results provide convincing evidence that the CDA caries risk assessment tool is valid in an adult population seeking care. The present data demonstrate that CDA CRA form can be successfully implemented and utilized in everyday clinical dental practice as it accurately identified patients at high caries risk and extreme risk.

In conclusion, the CDA CRA form presented here is based on a combination of factors related to the caries disease occurrence that are easy to record/assess in everyday practice. The procedure to use the form is straightforward and follows the dental history and clinical examination.<sup>8</sup> In the present study, simple instructions were used by multiple providers with the outcome presented here at follow-up examinations with very good success in identifying high and extreme caries risk individuals. The present results, based on a very large population of adults, clearly show the validation of the CDA CRA form as being helpful in screening patients who are at high or extreme risk of developing further caries lesion unless intervention/prevention therapy is used. Future research is needed to determine if those who received treatment had lower caries rates on follow-up. ■■■■



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# New Directions in the Etiology of Dental Caries Disease

V. KIM KUTSCH, DMD, AND DOUGLAS A. YOUNG, DDS, EDD, MBA, MS

**ABSTRACT** This review explores the multifactorial etiology of dental caries disease. Current theories suggest that a singular focus on mutans streptococci and lactobacillus as the sole causative microbiological agents is no longer a viable strategy in treatment of this prevalent disease. Dental caries is an infectious transmissible disease process where a cariogenic biofilm in the presence of an oral status that is more pathological than protective leads to the demineralization of dental hard tissue.<sup>1</sup>

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*Conflict of Interest Disclosure: Dr. Kutsch is the CEO of Oral BioTech, which manufactures CariFree.*

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Recent research also indicates dental caries has genetic components. When examining for beta-defensin-1, a salivary protective protein, there are three polymorphisms (genetic expressions or variations) of this gene. Individuals with one particular genetic polymorphism, the G20A expression, exhibited five times the DMFT scores of the other two genetic variants.<sup>2</sup> Genetic variations associated with taste have also been implicated as a hereditary component influencing dental caries.<sup>3</sup> Previous reports have characterized the influence of genetic variation on taste preferences and dietary habits.<sup>3</sup> Statistically, significant associations were seen in TAS2R38 (bitter) and TAS1R2 (sweet) for caries risk and/or protection. Children with the TAS2R38 gene object to the bitter taste of many green vegetables, prefer eating sweets, and have demonstrated a significant correlation with increased caries experience.<sup>3</sup>

## The Role of Bacteria

Originally thought to be a disease of two primary pathogens, mutans streptococci and lactobacillus, the current biofilm disease model for caries is one of multiple pathogens. Marsh demonstrated in the ecological plaque hypothesis that dental caries is a pH-specific disease.<sup>4</sup> These pathogens are acidogenic and aciduric bacteria that metabolize carbohydrates into acids, resulting in acidic conditions in the oral biofilm. However, it is the acidic pH per se, not the carbohydrate availability, that provides the selection pressure favoring these cariogenic organisms in the biofilm environment.<sup>5</sup> When these acid-producing bacteria dominate the biofilm, the normal balance in the mouth that influences demineralization and remineralization changes to produce prolonged episodes of low pH, resulting in demineralization of the teeth and net mineral loss. Recent biofilm research has introduced the so-called “extended ecological plaque hypothesis” where even

commensal bacteria have demonstrated the ability not only to adapt to live in the acidic environment, but to also develop the ability to produce acid themselves, thus contributing significantly to the disease process.<sup>6,7</sup>

About 700-800 different bacteria species have been identified from the human oral microbiome, making the mouth the most microbially diverse environment in the body.<sup>8</sup> However, the picture may be even more complex than that; DNA identification research examining the hyper-variable 6 vector region of the 16 S gene sequence, would indicate that there may be 3,600-6,800 different bacteria in the mouth. Furthermore, when a bacterium replicates its DNA, it produces a specific amount of pyrophosphate, and when examining this metric, this research would anticipate about 19,000 distinctly different bacteria in the human oral microbiome. This research would suggest an even more complex microbial environment and bacterial component in dental caries.<sup>9</sup>

Research also has suggested that dental caries may have systemic effects. While the oral-systemic connection with periodontal disease has gathered a great deal of attention in the past decade, dental caries disease may also have similar consequences. In 2009 Nakano et al. reported *Streptococcus mutans* in the coronary arteries and heart valves 78 percent of the time. This suggests that dental caries may play a role in bacteremia and peripheral vascular disease.<sup>10</sup>

In summary, the current biofilm model of dental caries is a complex picture: multiple pathogens, systemic effects, and hereditary components layered on interactions of diet, behavioral, environmental, socioeconomic, and physiological risk factors. Thus, diagnosis for dental caries disease becomes more complex and involves examining these different parameters to get a clearer picture of this disease.

## The Role of Saliva

Saliva plays many important roles in the mouth in health and digestion and offers some real potential in evaluating dental caries risk. Saliva is a unique fluid in the body, it is supersaturated with calcium and phosphate, helping maintain the mineral content of teeth, it contains protective proteins and antibodies, enzymes for digestion, lubricants for chewing and swallowing, electrolytes for buffering the pH and many other factors that contrib-

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ute to a healthy balance.<sup>11</sup> As a diagnostic specimen, saliva is readily available, it is easily collected and stored, and it is a noninvasive procedure. There have been more than 2,290 proteins or proteomes identified in human saliva, and 40 percent of the plasma proteins associated with different disease processes can also be found in the saliva.<sup>12</sup> As salivary diagnostic technology continues to develop, there will be an opportunity for dental practices to play a major role in point-of-care diagnosis.<sup>13</sup>

Saliva also offers opportunities as a specimen for caries risk assessment and diagnosis. Multiple parameters of saliva have been studied and can be measured. Current tests include saliva flow, both unstimulated (resting) and stimulated; salivary pH, both unstimulated (resting) and stimulated; buffering capacity of the sa-

liva; bacterial pathogen presence, including: mutans streptococci and lactobacillus; plaque cariogenic potential; and, finally, biofilm activity level measured by ATP bioluminescence. The challenge facing dentistry today is finding a valid chairside metric to test for caries risk that is time efficient, cost-effective and also predictive of caries presence and progression.<sup>14</sup>

## Salivary Flow (Resting and Stimulated)

Insufficient saliva flow (resting and stimulated) may lead to the subjective complaint of dry mouth, or xerostomia, a condition that jeopardizes the teeth from the lack of buffering ability and reduced availability of calcium phosphate for remineralization. Saliva flow reduces as a natural part of aging, by a multitude of prescription medications and is from a practical standpoint nonexistent during sleep. Radiation therapy and conditions like Sjögren's syndrome or other autoimmune connective tissue diseases, diabetes, hepatitis C, and HIV infection all can reduce the amount of saliva flow. Inadequate saliva flow is a known risk factor for dental caries, less than 0.7 ml of stimulated saliva per minute places a patient at high risk or extreme risk.<sup>15</sup> Recently, reduced saliva flow has been tied to childhood obesity and increased risk for dental caries in children.<sup>16</sup>

Saliva flow rate should be assessed in both stimulated and resting saliva. Commonly, clinicians only assess the stimulated flow rate because stimulated saliva flow is easy to measure. Simply have the patient chew on paraffin wax and spit into a graduated cup, measuring mls/minute. While this test is very accurate to measure stimulated saliva flow, the test itself may not be highly predictive for dental caries experience.<sup>17</sup> If the stimulated flow rate is below .7 ml/minute, then the patient can now be

diagnosed as having “salivary gland hypofunction,” the preferred term when flow is measured quantitatively rather than using the subjective term “xerostomic.”

Measuring resting saliva flow is less often done perhaps because it requires the patient to “drool” into a collection vessel measuring the mls/minute of flow. When performing the test, patients were instructed to initially swallow and then tilt their head forward with the chin near the chest and instructed to avoid any lip or tongue movements, talking, or swallowing. The saliva was allowed to pool in the front of the mouth for exactly two minutes without swallowing. It was then gently drooled into a graduated cylinder. The two-minute collection process was repeated twice and then patients were asked to gently empty their mouths of any remaining saliva into the collection vessel. Patients should be informed that there may be little or no saliva to expectorate and not be concerned if that should prove to be the case. The total quantity was divided by four minutes to obtain a flow rate per minute. The lower end of normal flow rate may be as low as 0.15 ml/min.<sup>18</sup>

Admittedly the drool test described above is not very popular in clinical practice and a surrogate test to help identify the presence of abnormal resting saliva flow, such as the physical appearance of saliva (thick and bubbly) and the inability of minor salivary glands of the lips to produce visible “beads” of saliva within one minute after drying with gauze, have been reported in clinical use. Although using the appearance of resting saliva has the support of at least one study that correlated surface tension of saliva to dental caries using technology like droplet surface tensiometry, these surrogate tests should be considered anecdotal at best and should be lightly weighted until a larger body of evidence is presented.<sup>19</sup>

### Salivary pH (Resting and Stimulated)

Although resting and stimulated salivary pH is easily measured with a high degree of accuracy with the use of pH sensitive test strips, they must be interpreted carefully. While the data accurately reflect the pH of the saliva, the real challenge for pH measurements is how to use these data to make useful clinical decisions. It is important to keep in mind that the value in using any salivary test will depend not only on the type of saliva measured (resting or

than attempting to relate pH to predicting caries risk. It may help in the selection of products to neutralize acid and restore the mouth to a healthy state. Part of this is because the salivary pH may or may not be reflective of the actual biofilm pH on the teeth or it may reflect affects of diet if the patient has eaten.

Resting saliva will also have different pH measurements, depending on the areas of the mouth in which they are sampled, thus pH (like biofilm and caries lesions) is site-specific. In fact, an interesting exercise is to sample saliva at different areas of the mouth and measure pH using pH-sensitive test strips. Although not validated, one technique is to collect saliva from a patient (in a resting state) by having them expectorate only once into a cup and measuring the pH of that single collection. A clinician may use this as an example to educate patients about the effects of resting saliva pH on remineralization/demineralization dynamics as well as the role it plays on the selection process of biofilm. Although measuring pH may help patients learn how their behaviors affect this dynamic balance, there is little evidence it predicts future caries risk and should not be used for that purpose.

In summary, while salivary pH (resting and stimulated) can accurately and easily be measured chairside in real time, one should use constraint in using any test by itself as being predictive of caries experience; one also must consider the local biofilm, chemistry, and salivary composition.<sup>20</sup> It may help in modifying behavior and choosing products that will help neutralize acid. Using pH in conjunction with these other factors will, however, produce a rubric to provide an opportunity to modify the local environment using chemical interventions.<sup>15</sup> Future research is needed to determine if this approach will actually result in better outcomes.

### THE REAL CHALLENGE for pH measurements is how to use these data to make useful clinical decisions.

stimulated), time and location sampled, but most importantly what is going on with the local biofilm, chemistry, and salivary composition; together they will determine remineralization or demineralization of dental hard tissues.<sup>20</sup>

Minor salivary glands normally produce saliva that has a lower pH than the major salivary glands and, considering the amount of time saliva is actually being stimulated, resting (unstimulated) saliva may perhaps be more important to evaluate clinically than stimulated saliva. Although one study by Subramaniam in 2010 demonstrated a significant correlation between resting salivary pH and dental caries in the primary dentition of children with cerebral palsy, in the end, the real value of pH testing may well be as a teaching tool rather

## Buffering Capacity

The quantitative measure of resistance to pH changes is called buffer capacity. In 1959, Ericsson introduced a test to measure the buffering capacity of an individual's saliva.<sup>21</sup> The expression of this test described the ability of a patient's saliva to buffer or neutralize the salivary pH during acidic challenges. The Ericsson test proved to be highly predictive for dental caries. The challenge is that this is not a chairside test but rather a laboratory procedure that requires several hours to complete. Chairside tests are currently available for measuring buffering capacity of stimulated saliva; however, some studies question their reliability.<sup>21</sup> A recent study of these tests demonstrated one technique used on resting saliva that was consistent with the Ericsson data, but the other tests on stimulated saliva were not.<sup>22</sup> Other analyses on buffering capacity recommended a need for additional research.<sup>23</sup> The salivary-buffering capacity appears to have caries predictive value in the Ericsson test, but available chairside tests may not be as accurate.

As with testing salivary pH, care must be exercised in the interpretation of a buffering test, even if the result is "normal." For example, the test does not measure the presence of salivary hypofunction (xerostomia), so one could conceivably get a "normal" buffering capacity on a patient who has severe salivary hypofunction. As mentioned above, the reliability of these chairside tests to assess buffering capacity is in question and should be considered along with other factors to modify the local environment using chemical interventions.<sup>15,21</sup>

## Measuring Bacterial Load or Activity

Research data have long established a strong predictive relationship between levels of salivary mutans

streptococci, lactobacillus, and, more recently, *S. sobrinus* and bifidobacteria and dental caries.<sup>24</sup> Blood agar plating and polymerase chain reaction (PCR)-based bacterial identification provide accurate measurements of these known pathogens in the saliva. The challenge for this parameter again is one of an accurate and predictive chairside test.

While several chairside cultures are available, recent independent research indicated that none of them accurately identified the level of cariogenic bac-

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teria or *S. mutans* present.<sup>25</sup> A sample of the patient's saliva is collected and then cultured on selective agar media for 48 hours. It is a management challenge to schedule patients to collect the sample then recall them for reading and discussion of the test after 48 hours.

Monoclonal antibody testing has been established for measuring individual pathogens and a test for mutans streptococcus is currently available.<sup>26</sup> Measuring specific pathogens in light of the multipathogen biofilm model for this disease is questionable. In other words, such specific pathogen targeting may not be able to provide adequate predictive value. In addition, in light of the extended ecological plaque hypothesis where low pH nonmutans bacteria and actinomyces are acid-producing and

thought to be precursors to a mature acidogenic biofilm dominated by MS and LB, the diagnosis would be missed by both specific monoclonal antibody test and selective culturing methods. In summary, bacterial identification offers some promise of predictability; however, there is a need for additional evidence correlating the chairside test currently available to actual caries disease risk.

The cariogenic potential of a plaque/biofilm sample is another chairside test that is currently available. It measures the ability of the patient's plaque/biofilm to metabolize sugar. A small sample of the patient's plaque is collected, a sugar solution is added, and then a pH-sensitive dye is added. The resulting color change is read and indicates the patient's "cariogenic potential." While one study indicated the cariogenic potential correlated well with the bacterial levels, additional research and validation correlating the test to the patient's caries risk are needed.<sup>26</sup> In the meantime, the test has strong educational value for patients to understand the role of diet and pH in dental caries. This chairside test takes about 10 minutes to perform.

ATP Bioluminescence is a technology that has been around for a long time.<sup>27</sup> It is used in a multitude of environments where precise measurement of bacterial activity is necessary, e.g., food manufacturing, wastewater treatment.<sup>28</sup> The concept behind ATP bioluminescence in dental caries is based on the known adaptive mechanism of aciduric bacteria.<sup>7</sup> These bacteria survive and thrive in acidic pH environments because they have the ability to pump the hydrogen (protons) ions out of their cell. In addition to other adaptive mechanisms, they maintain a more neutral intracellular pH in this harsh environment. This requires a



tremendous expenditure of ATP.<sup>29</sup> By measuring ATP levels in the biofilm, a determination of overall bacterial load and biofilm activity can be assessed.<sup>30,31</sup> Recent scientific studies further indicate a significant positive correlation to the patient's overall *Streptococcus* count, mutans streptococcus counts, and directly correlates to the patient's caries risk status.<sup>31-34</sup> ATP bioluminescence then becomes a risk tool and a potential biometric to identify and assess the level of cariogenic bacteria, and also act as a surrogate endpoint to measure effectiveness of anti-caries therapy. ATP bioluminescence is a simple chairside test that involves swabbing a specific site on the teeth and then a 15-second measurement with a meter. It is efficient, effective, and provides reasonable predictability without recalling the patient as in the culturing technique.

## Conclusion

The complex nature of a multifactorial, pH-driven biofilm disease such as dental caries whose onset and progression is influenced by so many diverse bacterial, dietary, environmental, socioeconomic, physiological, and genetics risk factors exemplifies the need for the dental profession to look beyond tooth restoration. It requires a careful assessment of each of these factors, not in isolation but taking all unique and dynamic factors into account in the assessment of each individual patient. Science has made significant advances in bacteria and saliva assessment including new methods of measuring bacterial load, pH, buffering capacity, and flow of both stimulated and unstimulated saliva. The challenge in a complex biofilm disease like dental caries is identifying a risk assessment/screening/biometric

tool that is time-efficient at chairside and provides real-time results, and is predictive for the disease activity.<sup>14</sup>

Salivary diagnostics offers the opportunity to develop such instruments, without which the biometric becomes tooth cavitation (the endpoint of the disease process). It is preferable to objectively treat and prevent caries disease rather than wait to see if cavitations continue to develop. However, the lack of evidence, minimal evidence, and conflicting evidence for many of these new methodologies will inevitably result in variations on how concepts and products are used in clinical practice. Differing points of view are to be expected in the presence of imperfect evidence.

In addition to dental caries disease, the future for salivary diagnostics for other diseases and conditions as an emerging science is very promising. New tests for saliva include multiple factors that relate to oral and systemic diseases. Currently, saliva is being analyzed for periodontal disease indicators including genetic testing for IL1A and B genes, along with measurements of periodontal pathogens present.<sup>35</sup> The saliva has been a reliable source for markers of myocardial infarction, and stroke.<sup>35</sup> Future tests also include examining for irregular exosomes released by epithelial minor salivary glands that indicate the presence of oral cancer.<sup>36</sup> Breast cancer markers have also been identified in saliva and provide better information about prognosis at point of diagnosis, and act as biometrics during cancer therapy.<sup>37</sup> The database for this emerging field is being collected at the Saliva Ontology Project at UCLA.<sup>38</sup> Saliva is a complex fluid that provides many important roles in the body and it promises to provide many opportunities for diagnosis in the near future. ■■■■

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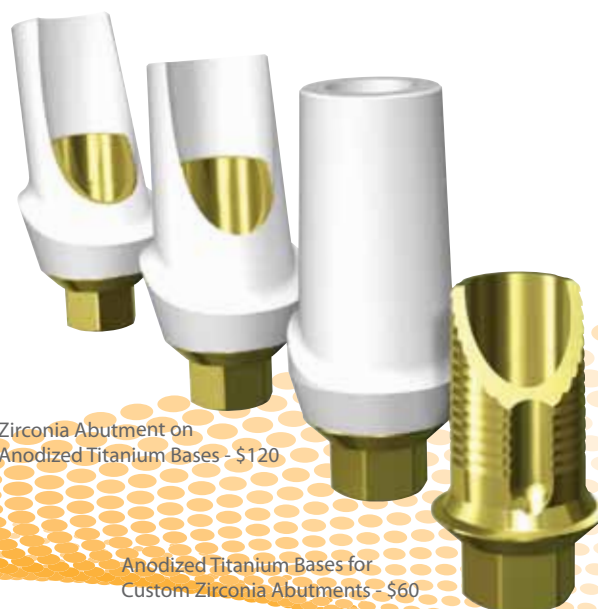
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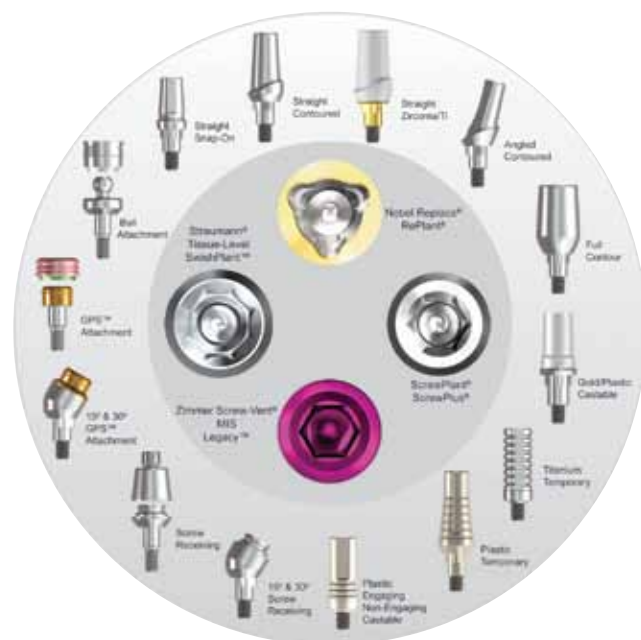
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# Into the Future: Keeping Healthy Teeth Caries Free: Pediatric CAMBRA Protocols

FRANCISCO RAMOS-GOMEZ, DDS, MS, MPH, AND MAN-WAI NG, DDS, MPH

**ABSTRACT** Early childhood caries prevalence has increased significantly in children ages 2-5 years.<sup>1</sup> ECC disproportionately affects lower socioeconomic and minority groups, is a predictor for future decay, but is preventable and manageable.<sup>2</sup> Caries risk assessment systematically derives a patient's caries risk and is important during an infant oral health visit beginning at age 1. Information obtained through a risk assessment can guide a disease management care path tailored to an individual's age and risk to effectively treat and manage one's caries disease process.<sup>3</sup>

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A recent national health survey from 2007 found California and Texas, the two most-populated states in the United States, to rank among the lowest in children's oral health.<sup>4</sup> In addition, Hispanic children are the most at risk for poor oral health, since 28.5 percent of Hispanic children compared to 19.1 percent of white children, have not seen a dentist by the age of 17. Increased awareness of the causes and consequences of ECC could help families, especially those who suffer from disparities in access to care, obtain dental care and institute preventive measures within their family practices.

Many parents and caretakers are unaware of the role they play in bacterial transmission to their child. Caregivers pass organisms and bacteria to infants

orally through close contact (vertical transmission).<sup>5</sup> Furthermore, women from vulnerable underserved communities, and some of their providers, fail to recognize the value of good oral health and relevant importance of regular dental visits and care during pregnancy.<sup>6</sup>

It is critical that oral health providers, whether at academic centers, in private practice, or at safety net sites (such as health centers and hospital clinics) embrace risk assessment and disease management in addressing ECC. In its Life Course Model 2010 concept paper, "A conceptual framework that helps explain health and disease patterns particularly health disparities — across populations and over time," the U.S. Department of Health and Human Services Maternal and Child Health Bureau (MCHB) posits,



“that interventions that reduce risks and increase protective factors can change the health trajectory of individuals and populations.” It further suggested “the need to: refocus resources and strategies for a greater emphasis on early (“upstream”) determinants of health; incorporate earlier detection of risks coupled with earlier intervention; and promote protective factors while reducing risk factors at the individual, family, and community levels.”<sup>3,7</sup>

Caries management by risk assessment (CAMBRA) is designed for use with newborns to 5-year-old children. It is easy to use and offers an approach to disease prevention management that integrates risk assessment of childhood caries as an integral component of a comprehensive oral health visit.

### Caries Management by Risk Assessment

*CAMBRA assists providers to systematically:*

- Assess each child and his caregiver’s caries risk in an individualized manner;
- Tailor a specific preventive therapeutic management plan or “care path”;
- Customize a restorative plan in conjunction with preventive care; and
- Plan a timely, specific, and appropriate periodicity schedule based on the child’s caries risk.

To effectively prevent and management the disease of caries, care should begin early, ideally during an age 1 comprehensive oral exam visit. There are six basic steps in the infant oral care visit. A caries risk assessment is the first of these six critical steps, giving the provider more information to help them consider the risk and health status of each patient before beginning the exam.<sup>3</sup>

Caries risk assessment provides information pertaining to three specific overarching domains:

*Risk and/or biological factors* such as continual bottle use, sleeping with a bottle, frequency and types of snacks, a child taking any medications as well as other risk factors;

*Protective factors* such as the use of fluoridated tap water, use of fluoridated toothpaste, or the use of xylitol on a continuous basis; and

*Clinical findings* such as the presence of early demineralized enamel surface, cavitated lesions, plaque, lack of salivary flow, etc. (informa-

**CARIES RISK**  
assessment can  
be easily and  
efficiently performed  
by dental and  
medical providers.

tion to be obtained from Step 4).

Through a short and brief interview with the caregiver, information is gathered to assess the child’s risk of caries development and disease progression as low, moderate, or high. For example, a child may be at high risk if the child goes to bed or has a constant exposure with a bottle containing liquids with natural or artificial sugar, or snacks throughout the day, etc. Protective factors include brushing with a smear of fluoridated toothpaste at least once daily, especially before bed at night or drinking fluoridated tap water regularly.

Three findings are always associated with a high caries risk. These are: 1) new carious lesions in the primary caregiver within the past 12 months; 2) prior caries and/or restorations in the child; and 3)

white spot lesions, decalcification enamel defects or other obvious decay in the child (**TABLE 1**). The information obtained from a caries risk assessment allows the care provider to formulate a caries risk profile for the child, an essential first step to determining the prevention and treatment plan, as well as the periodicity of patient follow-up/recall (one month, three months, six months, or one year).<sup>3</sup> Caries risk assessment can be easily and efficiently performed by dental and medical providers.

Step 2 consists of proper positioning of the infant. The knee-to-knee position allows an effective and efficient visualization of the child’s oral cavity and dentition. The child is laying supine, with his head resting in the care provider’s lap. This position allows the child to see his parent and the parent to see what the care provider sees.

Step 3 involves a toothbrush prophylaxis, which is effective in the removal of plaque on most teeth. Using the tell-show-do technique, the care provider can demonstrate the proper technique for brushing the child’s teeth. Step 4 is the clinical examination and Step 5 is the application of fluoride varnish, which is to prevent tooth decay. Fluoride varnish is to be applied every three to six months depending on the caries risk of the child.<sup>3,8,9</sup>

Step 6 involves the care provider working with the parent to determine a mutually agreed upon set of self-management goals appropriate for the family (**FIGURE 1**). The care provider is to first transmit a summary of the findings obtained from the caries risk assessment and clinical examination, and explain to the parent the causes of the caries process. Together with the parents, one or two self-management goals are to be identified for the family to work on to reduce the child’s risk factors and enhance his protective factors.<sup>3</sup> Parents should be



TABLE 1

**CAMBRA — Caries Risk Assessment Form for Age 0 to 5 Years**

Patient Name: \_\_\_\_\_ ID# \_\_\_\_\_ Age: \_\_\_\_\_ Date: \_\_\_\_\_

Assessment Date: \_\_\_\_\_ Please circle: BASELINE, three-month follow-up or six-month follow-up

	1	2	3	
<b>NOTE: Any one Yes in Column 1 signifies likely "High Risk" and an indication for bacteria tests</b>	Yes =CIRCLE	Yes =CIRCLE	Yes =CIRCLE	Comments:
<b>1. Risk Factors (Biological Predisposing Factors)</b>				
(a) Mother or primary caregiver has had active dental decay in the past 12 months*	Yes			
(b) Bottle with fluid <u>other</u> than water, plain milk and/or plain formula		Yes		Type of fluid:
(c) Continual bottle use		Yes		
(d) Child sleeps with a bottle, or nurses on demand		Yes		
(e) Frequent (>3 times/day) between-meal snacks of sugars/cooked starch/sugared beverages		Yes		#times/day:
(F) Saliva-reducing factors are present, including: 1. medications (e.g., some for asthma [albuterol] or hyperactivity) 2. medical (cancer treatment) or genetic factors		Yes		
(g) Child has developmental problems/CSHCN (child with special health care needs)		Yes		
(h) Caregiver has low health literacy, is a WIC participant and/or child participates in Free Lunch Program and/or Early Head Start		Yes		
<b>2. Protective Factors</b>				
(a) Child lives in a fluoridated community or takes fluoride supplements by slowly dissolving or as chewable tablets (note resident ZIP code)			Yes	
(b) Child drinks fluoridated water (e.g., use of tap water)			Yes	
(c) Teeth brushed with fluoridated toothpaste (pea-size) at least once daily			Yes	
(d) Teeth brushed with fluoride toothpaste (pea-size) at least 2x daily			Yes	
(e) Fluoride varnish in last six months			Yes	
(f) Mother/caregiver chews/dissolves xylitol chewing gum/lozenges 2-4x daily			Yes	
<b>3. Disease Indicators/Risk Factors – Clinical Examination of Child</b>				
(a) Obvious white spots, decalcifications enamel defects or obvious decay present on the child's teeth*	Yes			
(b) Restorations present (past caries experience for the child)*	Yes			
(c) Plaque is obvious on the teeth and/or gums bleed easily		Yes		
(d) Visually inadequate saliva flow		Yes		
(e) New remineralization since last exam (List teeth):				

Child's Overall Caries Risk\* (circle):

High

Moderate

Low

Child: Bacteria/Saliva Test Results:

MS:

LB:

Flow Rate:

ml/min:

Date:

Caregiver: Bacteria/Saliva Test Results:

MS:

LB:

Flow Rate:

ml/min:

Date:

Self-management goals:

1) \_\_\_\_\_

2) \_\_\_\_\_

**VISUALIZE  
CARIES BALANCE**

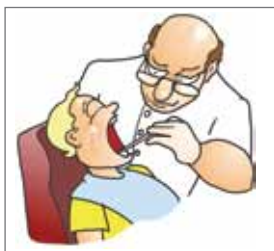
\*Assessment based on provider's judgment of balance between risk factors/disease indicators and protective factors.

Doctor signature/#: \_\_\_\_\_ Date: \_\_\_\_\_

## Self-Management Goals for Parent/Caregiver

Patient Name \_\_\_\_\_

DOB \_\_\_\_\_

Regular dental visits  
for childFamily receives  
dental treatment

Healthy snacks

Brush with fluoride  
toothpaste at least 2  
times daily

No soda



Less or no juice

Wean off bottle  
(no bottles for sleeping)Only water or milk in  
sippy cups

Drink tap water

Less or no junk food  
and candyUse xylitol spray, gel  
or dissolving tablets

**IMPORTANT:** The last  
thing that touches  
your child's teeth  
before bedtime is  
the toothbrush with  
fluoride toothpaste.

Self-management goals 1) \_\_\_\_\_  
2) \_\_\_\_\_

On a scale of 1-10, how confident are you that you can accomplish the goals? 1 2 3 4 5 6 7 8 9 10

Signature \_\_\_\_\_

Date \_\_\_\_\_

Practitioner signature \_\_\_\_\_

Date \_\_\_\_\_

FIGURE 1. Self-management goals.

encouraged to adopt a healthy oral lifestyle for their child, assist their children from an early age to maintain a proper diet and oral hygiene, and establish and maintain a dental home for their child.<sup>3</sup> When self-management goals are revisited during recall visits, caregivers and their children can receive positive reinforcement as they see how meeting their goals can improve their child's caries risk and result in better oral health outcomes.

### Risk-Based Care Paths

Once a child's caries risk has been determined, the care provider, in partnership with the child's caregiver, can determine a multifaceted care path appropriate for the family, based on the child's age and individualized needs. Research supports the use of fluoride varnish in combination with improved diet and oral hygiene counseling, and families should be encouraged to drink fluoridated tap water and/or use fluoridated toothpaste, which are very important aspects and measures of preventive care.<sup>8,9</sup> However, a care path or decision tree can aid the provider in determining a specific combination of diagnostic, preventive and restorative procedures, and the periodicity of these recommended measures that are appropriate for the child and his family to improve and/or stabilize a child's caries risk profile.

Care paths are expected to be dynamic and change over time as the effectiveness of new as well as current protocols are validated by scientific evidence. **TABLES 2 AND 3** are examples of the care paths at this time recommended for children ages 0-2 and ages 3-5, respectively. Newer products, such as remineralizing gels, or new uses for existing products such as glass ionomer to be used as sealants, are now available and can be considered viable treatment options. As evidence continues to evolve, and new studies advocate for the use of

agents, such as probiotics and topical applications of providone-iodine to reduce high oral bacteria levels, these modalities will be added to the care path. While the evidence for the effectiveness of preventive and treatment modalities continues to grow, standardized and widely accepted protocols are limited. Therefore, each practitioner should use careful consideration based on emerging available evidence and one's own experience when considering when and how to introduce use of newer modalities into their patients' care paths.

**FAMILIES SHOULD BE**  
encouraged to drink  
fluoridated tap water and/or  
use fluoridated toothpaste,  
which are very important  
aspects and measures of  
preventive care.

### Quality Improvement — Potential for Transforming Oral Health Care Delivery and Improving Outcomes

Evidence supports the effectiveness of dietary control, fluoride use, and other modalities such as xylitol, in preventing and controlling dental caries, a chronic infectious disease caused by acids produced by oral bacteria metabolizing fermentable carbohydrates.<sup>10</sup> Since the risk for caries development and caries activity differs among individuals and may change in each individual over time, caries risk assessment performed initially, and periodically thereafter, allows for a determination of a patient's relative risk, from which an adoption of an evidence-based prevention plan that can be customized.

Disease management of caries (e.g., CAMBRA) is modeled after the medical

management of chronic conditions in which the patient (or child's family) is engaged in day-to-day health behavior modifications that address disease etiology. It requires parent/family engagement in dietary control and applications of fluorides and other preventive modalities. The progress in stabilizing and reducing the risk for the caries process is monitored using caries risk assessment tools.

Despite the evidence supporting the effectiveness of bio-behavioral approaches and interventions in preventing and controlling caries, including caries risk management, to improve patient outcomes, disease management of caries has not been widely implemented in clinical dental practice. It is known that barriers exist in our current oral care delivery systems, which do not easily permit effective implementation of disease management of caries in clinical practice. These barriers include a provider's lack of knowledge, skills and comfort; a parent's knowledge, preferences and expectations; reimbursement favoring surgical management of caries; and coordination and follow-up. While reimbursement methodologies need to be altered from the current "one-size-fits all" to include coverage of caries risk assessment and more frequent and intensive preventive services for higher-risk individuals, quality improvement (QI) can foster and accelerate the adoption of changes needed to redesign current care delivery systems. QI methods also have allowed for the testing of system changes in order to produce better system performance and improved outcomes for patients and populations.

QI is defined by Batalden as the combined and unceasing efforts of everyone — health care professionals, patients and their families, researchers, payers, planners and educators — to make changes that will lead to better patient outcomes (health), better system performance (care) and better pro-

TABLE 2

## Example of a Caries Management Protocol for 0–2 Year Olds

Risk Category Ages 0 to 2	Diagnostic			Fluoride
	Periodic Oral Exams	Radiographs*	Saliva Test	
Low	Annual	Posterior bitewings at 12-24 month intervals if proximal surfaces cannot be examined visually or with a probe	Optional baseline	<b>In office:</b> No <b>Home:</b> Brush 2x day w/ smear of F toothpaste
Moderate	Every 6 months	Posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Suggested	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/smear of F toothpaste <b>Caregiver:</b> OTC sodium fluoride treatment rinses
Moderate; noncompliant	Every 3-6 months	Posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/smear of F toothpaste then apply a smear of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
High	Every 3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/smear of F toothpaste then apply a smear of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
High; noncompliant	Every 1-3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/smear of F toothpaste then apply a smear of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
Extreme	Every 1-3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/smear of F toothpaste then apply a smear of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses

Preventive Intervention						Restoration**
Xylitol	Sealants	Antibacterials/ Probiotics	Anticipatory Guidance/ Counseling	Self- Management Goals	White Spot / Precavitated Lesions	Existing Lesions
Not Required	No	No	Yes	No	n/a	n/a
<b>Child:</b> Xylitol wipes 3–4x daily <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6–10 grams a day	Glass ionomer- based materials recommended on deep pits and fissures	No	Yes	No	Treat w/ fluoride products as indicated to promote remineralization	n/a
<b>Child:</b> Xylitol wipes 3–4x daily <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6–10 grams a day	Glass ionomer- based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/ fluoride products as indicated to promote remineralization	n/a
<b>Child:</b> Xylitol wipes 3–4x daily <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6–10 grams a day	Glass ionomer- based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/ fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restor- ative treatment as patient cooperation and family circumstances allow
<b>Child:</b> Xylitol wipes 3–4x daily <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6–10 grams a day	Glass ionomer- based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/ fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restor- ative treatment as patient cooperation and family circumstances allow
<b>Child:</b> Xylitol wipes 3–4x daily <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6–10 grams a day	Glass ionomer- based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/ fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restor- ative treatment as patient cooperation and family circumstances allow



TABLE 3

## Example of a Caries Management Protocol for 3–5-Year-Olds

Risk Category —Ages 3 to 5	Diagnostic			Fluoride
	Periodic Oral Exams	Radiographs*	Saliva Test	
Low	Annual	Posterior bitewings at 12-24 month intervals if proximal surfaces cannot be examined visually or with a probe	Optional baseline	<b>In office:</b> No <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste
Moderate	Every 6 months	Posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Suggested	<b>In office:</b> F Varnish initial visit & recalls <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste <b>Caregiver:</b> OTC sodium fluoride treatment rinses
Moderate; noncompliant	Every 3-6 months	Posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste, then apply pea-size amount of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
High	Every 3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste, then apply pea-size amount of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
High; noncompliant	Every 1-3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste, then apply pea-size amount of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses
Extreme	Every 1-3 months	Anterior (#2 occlusal film) and posterior bitewings at 6-12 month intervals if proximal surfaces cannot be examined visually or with a probe	Recommended	<b>In office:</b> F varnish initial visit & recalls <b>Home:</b> Brush 2x day w/ pea-size amount of F toothpaste, then apply pea-size amount of calcium-phosphate paste left on at bedtime <b>Caregiver:</b> OTC sodium fluoride treatment rinses

Preventive Intervention						Restoration**
Xylitol &/or Baking Soda	Sealants	Antibacterials/ Probiotics	Anticipatory Guidance/ Counseling	Self-Management Goals	White Spot / Precavitated Lesions	Existing Lesions
Not Required	No	No	Yes	No	n/a	n/a
<b>Child:</b> Xylitol wipes 3-4x daily; products to substitute for sweet treats or when unable to brush <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6-10 grams a day	Glass ionomer-based materials recommended on deep pits and fissures	No	Yes	No	Treat w/fluoride products as indicated to promote remineralization	n/a
<b>Child:</b> Xylitol wipes 3-4x daily; products to substitute for sweet treats or when unable to brush <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6-10 grams a day	Glass ionomer-based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/fluoride products as indicated to promote remineralization	n/a
<b>Child:</b> Xylitol wipes 3-4x daily; products to substitute for sweet treats or when unable to brush <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6-10 grams a day	Glass ionomer-based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restorative treatment as patient cooperation and family circumstances allow
<b>Child:</b> Xylitol wipes/ products to substitute for sweet treats or when unable to brush <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6-10 grams a day	Glass ionomer-based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restorative treatment as patient cooperation and family circumstances allow
<b>Child:</b> Xylitol wipes 3-4x daily; products to substitute for sweet treats or when unable to brush <b>Caregiver:</b> 2 sticks of gum or 2 mints 4x day, total 6-10 grams a day	Glass ionomer-based materials recommended on deep pits and fissures	Recommend CHX for caregiver/ Recommend probiotics	Yes	Yes	Treat w/fluoride products as indicated to promote remineralization	ITR (interim therapeutic restorations) with glass ionomer-based materials or conventional restorative treatment as patient cooperation and family circumstances allow

fessional development (learning).<sup>11</sup> Quality improvement necessarily involves making changes that systematically incorporate evidence-based knowledge. It functions at the system level by which care delivery takes place, the physical and information level along with the complex social structures — i.e., health care professionals. In recent years, hospitals and medical health care systems have increasingly been using QI to effectively enhance patient safety, improve quality of care, and management of chronic disease and preventive care.

Although QI is not yet familiar territory to dentistry, it offers the potential to transform oral health care delivery in order to provide better oral health care, improve oral health outcomes, and to reduce costs of treatment of caries. A demonstration project funded by the DentaQuest Institute was implemented at two hospital-based dental practices that care for a disproportionate number of young children with ECC to test the feasibility of applying a disease management approach for ECC. Applying the principles of QI, it focused on making changes within the practices' oral health care delivery systems needed to implement an evidence-based disease management approach for ECC. Thirty months of results from the demonstration project have shown that a disease management approach to address ECC can be implemented into practice and has the potential to deliver better care, improve clinical outcomes, and reduce the overall cost of care.<sup>12</sup>

Ultimately, in order for the caries risk assessment to be successfully implemented as a universal model for quality improvement, the public and private systems of care must enact an equitable financial reimbursement model for these preventive treatments and its intervention care paths based on a medical model based on age and risk that is comparable and/or equitable to current surgical care compensation. Fur-

thermore, providers and insurers alike must embrace the dental ethics perspective of early disease prevention and early intervention that can benefit their future patients' short- and long-term oral health outcomes.

### Summary

While caries risk assessment was first endorsed by the American Dental Association, the American Academy of Pediatric Dentistry, and the American Association of Public Health Dentistry, its use by nondental professionals has become more

**A DISEASE MANAGEMENT approach to address ECC can be implemented into practice and has the potential to deliver better care, improve clinical outcomes, and reduce the overall cost of care.**

widespread.<sup>13-15</sup> The American Academy of Pediatrics now recommends the use of a risk assessment protocol during well-child visits to all its providers.<sup>16</sup> Community-based organizations, principally those working with underserved and vulnerable populations such as Early Head Start and Women, Infants and Children have found CAMBRA an essential tool as part of their comprehensive infant oral care programs.

CAMBRA's easy-to-use organized format of disease indicators, risk and protective factors, clinical findings, and self-management goals helps to facilitate oral health education, deepens the appreciation of oral health information, and increases the understanding of how individual behaviors can affect caries development and progression. By

embracing the concepts of caries risk assessment, early intervention and the establishment of a dental home, care providers could reduce their patients' risk of early childhood caries and improve children's oral and overall health.

The adoption of CAMBRA has not been universal in the dental community, which remains primarily focused on restorative treatment rather than on prevention and management of the disease. Since restorative and surgical care by itself does not address disease etiology, patients and caregivers must have the opportunity to increase their own oral health literacy, understand the causes and consequences of poor oral health and the value of "maintaining healthy teeth." As families gain an understanding of the value of preventive care and managing their oral disease risk, they will expect to partner with their oral health provider on plans for preventive care, monitoring, early intervention and treatments, as they have come to demand with their physicians. As QI becomes more familiar to dentistry, dental practices will be able to use QI methods to redesign their systems of care and train themselves and their staff to deliver customized risk-based prevention and disease management to patients. In doing so, the dental profession will have the potential to improve patient oral health outcomes and result in a reduction in cost of care.

It is important to recognize that, in order for a successful paradigm shift to disease prevention to occur full scale, dental insurance benefits must support risk-based disease management by reimbursing for risk assessments, monitoring and regularly assessing, and more frequent preventive care treatments for high caries risk patients. Despite these challenges, many practices and clinics have successfully implemented CAMBRA. Two other articles will be presented in the *Journal* as helpful guidelines to CAMBRA adoption and incorporation into practice. ■■■■

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# Prevention-Centered Caries Management Strategies During Critical Periods in Early Childhood

PETER MILGROM, DDS, AND DONALD L. CHI, DDS, PHD

**ABSTRACT** The current caries management model in the United States is based on restoring teeth rather than preventing disease. Scarce resources make this approach unsustainable, especially in clinical settings that serve vulnerable child populations. This paper presents specific prevention-centered caries management strategies that should form the basis of clinical interventions targeted at children during four critical periods in childhood: pre-age 1, ages 1–3, ages 4–5, and ages 6–7.

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Efforts to prevent and manage childhood tooth decay in vulnerable populations are hindered by scarce resources. In the current dental care delivery system, restorative procedures are delivered by highly trained dental professionals and require greater amounts of chairtime than preventive procedures, which are rate-determining factors in the number of patients a dental practice can serve. Furthermore, there is high demand for dentists in community health centers but dentists are in short supply.<sup>1</sup> Without structural changes to the financing and dental care delivery system, the maldistribution of dentists is unlikely to change.<sup>2</sup>

Furthermore, a recent study found that significantly larger proportions of

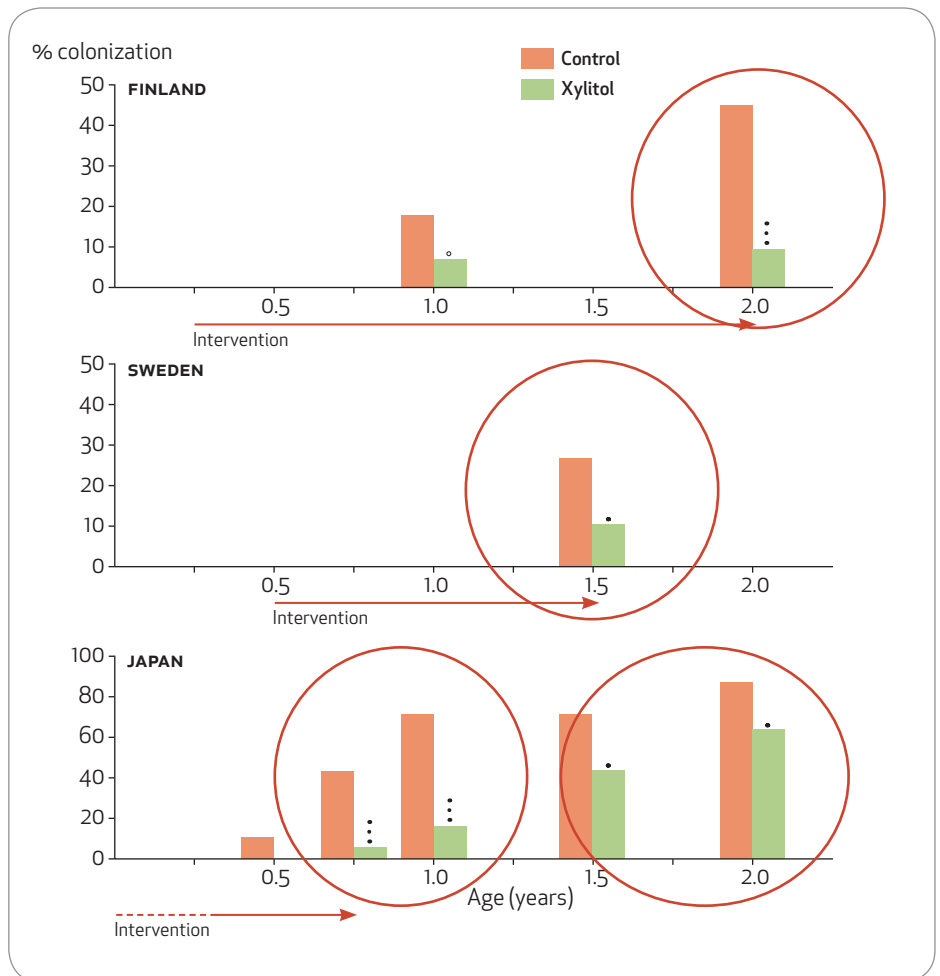
children in states with higher Medicaid dental reimbursement rates see a dentist than children in states with lower reimbursement rates.<sup>3</sup> While workforce distribution and reimbursement rates are only part of the strategy to manage and prevent childhood tooth decay, federal and state budget crises make it unlikely that new financial resources will become available to implement these and other strategies. Scarce resources make it essential that we optimize existing resources and change our thinking about caries management. Ultimately, this change in thinking needs to translate to changes in how tooth decay is approached and managed chairside. In this paper, the authors specify four critical periods in childhood and corresponding evidence-based patient care strategies:

- Pre-Age 1: Prevent mutans streptococci infections in the infant;
- Ages 1 to 3: Primary prevention of tooth decay in the deciduous teeth;
- Ages 4 to 5: Arrest tooth decay in the deciduous teeth; and
- Ages 6 to 7: Primary prevention of tooth decay in first permanent molars.

Readers may recognize that some of these strategies are being implemented. However, change is needed to align current practices with these caries prevention and management goals. Materials for dental practices that provide information on the strategies outlined in this paper are available at no cost from the Northwest Center to Reduce Oral Health Disparities website <http://depts.washington.edu/nacrohd/>. Practitioners and public health workers may have difficulty implementing all of these recommendations but this paper provides the basis for making reasoned decisions about what to do with limited funding and personnel.

### Pre-Age 1: Prevent Mutans Streptococci Infections in the Infant

Children at high risk for tooth decay become infected with cariogenic bacteria at a young age.<sup>45</sup> The mother or primary caregiver with high levels of mutans streptococci is generally the source of infection. Early mutans infections are consistently predictive of tooth decay in the deciduous teeth.<sup>6</sup> The proportions of children colonized with cariogenic bacteria increase with age. Available evidence suggests colonization rates can be lowered or postponed to an age at which the infections are less damaging to the deciduous dentition.<sup>7</sup> There is an appropriate analogy in medicine. As HIV/AIDS infection rates in pregnant women rose in previous decades, so did the number of infants born with maternally transmitted infection. Testing and treatment of maternal HIV/AIDS reduced the number of infected infants dramatically. Both the available testing and treatment



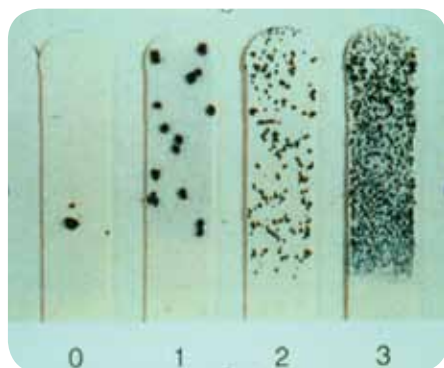
**FIGURE 1.** The results of three mother-child intervention studies that show that maternal interventions result in lowered colonization rates in the offspring. The dots indicate standard deviations. The studies were conducted in Finland, Sweden, and Japan and vary in the timing of the intervention and dose of xylitol but the results are similar (Courtesy of Dr. Eva Söderling, University of Turku).

technology and the dire consequences for the infant drove the adoption of this strategy.

A similar sense of urgency appears to be missing in dentistry. Indeed, a recent survey of general dentists in Oregon found that 91.7 percent thought dental care should be a routine part of prenatal care.<sup>8</sup> Yet, while the safety of dental care during pregnancy is established, the rate at which women go to the dentist during pregnancy, particularly women at higher risk of infecting their infants with cariogenic bacteria, is much lower. One reason for low dental use may be that women are unaware of the importance of dental care during pregnancy. Another explanation is that dentists understand the importance

of prenatal care but may refuse treatment for pregnant women because of confusion of which dental procedures are safe.

There are two approaches that prevent the transmission of caries-causing bacteria from mother to infant that are supported by scientific evidence. The first is providing high quality basic dental care including repair of caries-damaged teeth, extraction of teeth with large lesions and poor prognosis, and intensive use of chlorhexidine.<sup>9</sup> In a randomized controlled trial of this approach, new mothers with high initial levels of salivary mutans streptococci were randomized to either a treatment condition or control group. The treatment condition included



**FIGURE 2.** Results of plaque *Streptococcus mutans* testing in a 2-year old using the Dentocult SM system (Orion Diagnostics, Finland). All scores indicate the child is carrying the cariogenic organism with higher scores indicating greater risk for tooth decay (Photograph courtesy of Dr. Eva Söderling, University of Turku).

dietary counseling, professional tooth cleaning and oral hygiene instructions, fluoride and chlorhexidine treatment, and treatment of large carious lesions. Mothers in the control group received no preventive treatment. At age 23 months, 11 percent of treatment infants were infected with mutans compared to 45 percent of infants in the control group. The preventive program was stopped when the children reached age 3. At age 7, children in the treatment group continued to have much lower levels of salivary mutans than children in the control group.<sup>10</sup>

The second approach is the use of xylitol. Three of four clinical trials in which pregnant women and new mothers chewed xylitol gum habitually led to a greater proportion of infants being free of infection as their teeth erupted.<sup>7,11,12</sup> The time of initiation, dose, and frequency of gum chewing varied. However, the best results were seen when gum chewing began during the first year of the child's life and continued until all the deciduous teeth were erupted. Two of these studies suggest that prevention of early infection results in lower overall tooth decay prevalence in the deciduous teeth.<sup>7,12</sup> A frequency of chewing two to three times per day for five minutes and a total daily dose of five to six grams appears to be effective, although lower doses and frequencies may also be helpful. **FIGURE 1** provides a comparison of the outcomes of these studies.

In an application of these concepts, researchers at the Northwest Center to Reduce Oral Health Disparities helped develop and evaluate an intervention program aimed at improving dental care utilization for pregnant women.<sup>13</sup> The program, in Klamath County, Oregon, was a partnership of the local health department, managed dental and medical care organizations, and care providers. A community health partnership of stakeholders helped guide it. In the program, a dental hygienist worked at the Women, Infants, and Children (WIC) program of the health department to counsel and case manage dental care for the pregnant clients. Practices received training to overcome a reluctance to treat pregnant women. Dental utilization for the pregnant women rose from a baseline of 8.8 percent to more than 55 percent overall in the subsequent two years. Among women who were actively counseled, utilization reached almost 70 percent. Caries rates were lower in their offspring and a formal multicounty randomized trial is now being conducted.<sup>14</sup>

### Ages 1 to 3: Primary Prevention of Tooth Decay in Deciduous Teeth

It is well-understood today that infants whose teeth are heavily colonized by mutans streptococci will likely develop tooth decay.<sup>15</sup> An initial caries risk assessment should therefore be completed by age 2, when the full primary dentition has erupted. Caries risk assessment checklists that include these other risks are available and should help to make sure that resources are not wasted on unnecessary bacterial testing when tooth decay is already present. Assessing mutans levels in infants who have other risk factors before decay can develop is appropriate. The latter practice is uncommon in the United States but may be cost effective if it leads to the implementation of strategies that prevent tooth decay. An example of an inexpensive testing

system is shown in **FIGURE 2**. Once the infection is identified, steps should be taken to reduce bacterial levels and protect the teeth. These steps might include daily xylitol syrup placed topically on the teeth, introduction of fluoridated toothpaste and free home distribution of toothpaste, and topical application of PVP-iodine and sodium fluoride varnish.

Xylitol mouthrinses and syrups are available in the United States, and parents or compounding pharmacies can also make their own syrup from readily available recipes. In a University of Washington study, mothers applied a viscous, flavored-syrup on the child's teeth either two or three times per day for a total of about 8 grams of xylitol per day.<sup>16</sup> Tooth decay was reduced 50 to 70 percent over an ineffective sham treatment. The mothers began treatment when the child was about 15 months of age. Xylitol is safe and causes few side effects. Introducing the syrup slowly over a week's time can prevent osmotic diarrhea associated with xylitol.

The introduction of toothpaste coincident with eruption of the primary dentition provides a second home strategy. Fluorides and xylitol are compatible and the actions may even be synergistic.<sup>17</sup> There is a great deal of confusion among parents and dentists about the introduction of toothpaste caused by poor toothpaste labeling and contradictory advice by professionals. Worries about fluorosis have created uncertainty. There is a great deal of data to show that early introduction of fluoridated toothpaste is effective in preventing tooth decay and that fluorosis is mainly a risk when children are allowed to eat or lick toothpaste.<sup>18</sup> Twice per day brushing with fluoridated toothpaste is likely more effective than brushing once per day, and free home distribution is likely to increase the effectiveness of this intervention among families with children at high risk.<sup>19</sup>



**FIGURE 3.** Clinical application of PVP-iodine (Photograph courtesy of Dr. Ohnmar Tut).

Two to four sodium fluoride varnish applications per year have become the standard of care since University of Washington researchers helped develop and evaluate the Access to Baby and Child Dentistry (ABCD) program in the 1990s.<sup>20</sup> While helpful, varnish alone cannot prevent the development of tooth decay in children who are heavily colonized and have other risk factors.<sup>21</sup> For these children the simple application of topical 10 percent PVP-iodine prior to fluoride varnish appears, based on research by researchers at the University of Rochester, UCSF, and University of Washington, to provide greater protection.<sup>22-24</sup> The procedure is simple: the teeth are dried with cotton gauze, the teeth are painted with iodine with gentle pressure (**FIGURE 3**), and the excess iodine is wiped off. Then the fluoride varnish is applied as usual. For maximum safety the amount of iodine applied to the teeth should be limited to the amount that will saturate a 5 mm diameter cotton ball.<sup>25</sup>

Except for the small number of children who might be sensitive to iodine, the treatment carries little risk and is inexpensive to add to the standard varnish regimen. The iodine takes mutans streptococci levels to zero; they gradually increase again over two to three months. As with xylitol, the use of topical PVP-iodine is complementary to the use of fluorides in varnish or toothpaste.

### Ages 4 to 5: Arrest Tooth Decay

Dental interventions aimed at children in Head Start, a school readiness program for low-income children, are often well-intentioned but may not use scarce resources optimally. Children who are going to get cavities already have them by the time they appear in Head Start classrooms. The focus of efforts at this age should be arresting existing tooth decay and establishing good toothbrushing habits that can be carried forward to help protect the permanent dentition when the child is older. The primary candidate therapy for arresting tooth decay is diammine silver fluoride (also called silver diamine fluoride or silver fluoride).

Diammine silver fluoride is used outside the United States and is highly effective, even with a single application to a decayed tooth, allowing the tooth to be exfoliated normally even if a definitive restoration cannot be placed.<sup>26,27</sup> It is compatible with the interim restorative treatment (IRT) or alternative restorative treatment (ART) restorations with glass ionomer materials.<sup>27</sup> There appear to be no adverse effects from the use of diammine silver fluoride other than staining of carious tooth structure. Researchers at the Northwest Center to Reduce Oral Health Disparities are working with industry to make diammine silver fluoride available in the United States under grant funding from the Small Business Innovation Research program of the National Institute of Dental and Craniofacial Research.

Without diammine silver fluoride, the continued use of PVP-iodine along with fluoride varnish is helpful, if only partially effective, in arresting decay in this population. However, children at high risk with existing decayed teeth will continue to experience new decay if fluoride varnish is the only strategy employed.<sup>21</sup>

An additional innovation is the Hall

crown technique developed in Scotland.<sup>28</sup> The technique makes the application of stainless-steel crowns easier and less resource intensive and is acceptable to both clinicians and parents.<sup>29</sup> It takes advantage of the healing potential of the tooth pulp. In this technique, decayed teeth — that would in the United States require pulpotomies and crowns or multisurface restorations — are crowned without tooth preparation. Orthodontic spacers are placed interproximally to open space and then the crowns are cemented with glass ionomer cement. No anesthesia is required and children can tolerate the rapid procedure without having to be sedated or hospitalized. The primary occlusion adjusts as it does with all treatments in the transitional dentition. Ample evidence exists to show that this procedure is effective. If the tooth abscesses subsequently, the pulp treatment can be done through the crown. Instructional material on Hall crowns is available without charge on the Internet ([www.scottishdental.org/index.aspx?o=2802](http://www.scottishdental.org/index.aspx?o=2802)).

### Ages 6 to 7: Protect First Permanent Molars

Strategies in elementary school should include protection of erupting first permanent molars with glass ionomer sealants, required twice daily supervised toothbrushing with fluoridated toothpaste at school, use of xylitol, and application of PVP-iodine and fluoride varnish. Diammine silver fluoride could also be of use if available. Programs should always include screening for, and treatment of, abscesses in primary molars.

The primary strategy to protect first permanent molars ought to be the application of glass ionomer sealants in erupting teeth. Ample evidence exists to show that much of the tooth decay in the

occlusal surfaces of molars begins when the tooth is erupting.<sup>30</sup> Such sealants can be placed in the presence of moisture and are not as technique-sensitive as resin-based sealants that cannot be used easily in erupting teeth. In spite of good clinical evidence to the contrary, American dentists are unlikely to seal an erupted tooth with suspicion of decay and thus many unnecessary fillings are placed in the teeth most likely to require protection.<sup>31</sup> If the teeth are protected during eruption, the necessity to seal or fill them later will be reduced markedly. Many scarce resources are being used to place resin-based plastic sealants and fillings.

School programs of mandatory supervised toothbrushing using fluoridated toothpaste are effective.<sup>32</sup> Twice-daily brushing is more effective than once per day and supervision increases effectiveness further.

The habitual chewing of xylitol gum has been shown to reduce tooth decay in elementary school children.<sup>33</sup> The effective dose is 5 to 8 grams per day divided into three doses. There is currently no evidence for an effective single dose of xylitol. Studies are being conducted by Case Western Reserve University using gummy bear confections sweetened with xylitol and the results should be available soon.

### Additional Considerations: Children With Special Health Care Needs

Many, but not all children with special health care needs (CSHCN) are at increased risk for tooth decay. This is reflected in the American Academy of Pediatric Dentistry updated guideline on caries risk assessment.<sup>34</sup> Factors that predispose some CSHCN to poor oral health include the inability to cooperate during toothbrushing at home because of behavioral problems, diets high in fermentable carbohydrates, and medications to treat chronic health conditions that lead to dry mouth. A major part of the problem is inadequate access to earlier first dental

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visits and regular preventive dental care, especially for children with intellectual or developmental disabilities and severe chronic health conditions.<sup>35,36</sup> Contrary to anecdotal evidence, children with chronic health conditions under age 6 are not more likely than those without chronic health conditions to require dental treatment under general anesthesia.<sup>37</sup> Thus, the caries prevention and management strategies outlined in the previous sections apply equally to young CSHCN. This includes early first dental visits followed by regular prevention-oriented dental visits, iodine and topical fluoride applications up to four times per year, regular use of xylitol syrups and fluoridated toothpaste at home, diammine silver fluoride to halt caries followed by IRT-based treatment, and glass ionomer sealants applied to the erupting permanent first molars.

### Implementation of Resource-Optimizing Strategies in Clinical Public Health Practice

All of the resource-optimizing strategies outlined in this paper are based on evidence in the literature. However, there is a lag in the diffusion of many of these evidence-based strategies into private practice and public health (e.g., community health centers, Indian Health Service [IHS] clinics, federally qualified health centers) settings, which is common in medicine and dentistry.<sup>38</sup> These strategies can be easily incorporated into a busy clinical practice, as the materials are commercially available and easy to use. A rate-determining step in the dissemination and implementation of these caries prevention and management strategies is clinician motivation.

Clinicians must rethink their current practice patterns and shift from a treatment-oriented philosophy to one that is truly prevention-oriented. This

approach is the only viable option in the long-term given scarce resources and will lead to improved oral health for larger segments of the child population.

### Relevance to Health Policy and Policymakers

The reimbursement structure in the United States for health care services, including dental care, is based on the surgical model rather than primary care model.<sup>39</sup> Perverse financial incentives exist to restore teeth with fillings and crowns rather than prevent the disease. While this approach may work for subgroups of children who do not experience recurrent dental disease, it is not a viable model for children who get caught in a recurring cycle of treatment. Health policies that provide incentives for dental health professionals to prevent dental disease are needed. One example is reimbursement for implementation of a caries management system (CMS), a risk-based, minimally invasive system aimed at arresting and remineralizing early carious lesions in children.<sup>40</sup> CMS could easily incorporate fair market value reimbursement for treatments such as iodine, chlorhexidine, and diammine silver fluoride. Of course, preventive strategies included in a viable CMS would need to be supported by studies that demonstrate scientific as well as cost effectiveness. Another is to prohibit dental insurance companies from denying dental benefits to children younger than age 3 – a practice based on outdated clinical guidelines – or to arbitrarily limit the number of preventive dental visits that are paid for in a given year without considering the child's level of risk. If we are to move away from a model based on surgical intervention and toward one that is truly prevention-oriented, health policies need to reflect such a commitment.

### Conclusions

It is imperative that dentistry moves away from a surgical model of care, where the focus is on treating disease, to a prevention-oriented model of care, where child-centered strategies are used to prevent dental disease and use scarce resources more wisely. There are a number of promising evidence-based strategies that make this possible. For infants and children at increased risk for dental caries and poor oral health, evidence-based clinical strategies include the application of xylitol, PVP-iodine and fluoride, diammine silver fluoride, and glass ionomer-based sealants on erupting permanent molars. To make the most of scarce resources in dentistry, it is critical that we align our clinical practices and health policies with the most up-to-date scientific evidence on caries prevention and management. Adopting these strategies has the potential to lower the overall costs associated with dental treatment, make dental care available to more children, and improve the oral health as well as the general health of our nation's children. ■■■■

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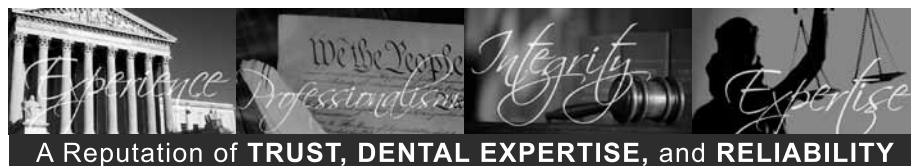
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# Motivational Interviewing Concepts and the Relationship to Risk Management and Patient Counseling

PHIL WEINSTEIN, PHD

**ABSTRACT** A brief version of motivational interviewing, a patient-centered counseling technique, has been found to be effective in reducing caries in high-risk young children. Motivational interviewing principles are discussed, examples of motivational interviewing interactions are provided, and the concept of readiness is presented in this paper. Dental professionals using caries management by risk assessment can readily use motivational interviewing strategies to reduce risks.

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**D**ental risk management, the assessment of the risk of dental caries by dental professionals, is the first and easiest step in preventing dental caries.

The subsequent step, the reduction of risk by the patient or the parent of the patient is much more difficult. Reducing risk involves communicating/interacting with the patient with the objective of encouraging the patient to engage in self-care or care-seeking behaviors that will reduce the risk that has been identified.

Given that there is no magic bullet to prevent dental caries (or other dental diseases), behaviors that reduce risk must be repeated over time. Until relatively recently, behavioral science has not been able to provide much guidance as the behavioral science literature

has not provided evidence that strategies involving communicating/interacting result in behaviors or actions that reduce risk. While provider-centered health education has been taught to dental professionals and promoted in practice, evidence indicates that this strategy has serious limitations, often resulting in new, short-term knowledge but no change in behaviors or actions.<sup>1-3</sup> Similarly, investigators have cited the failure of patient counseling, e.g., Weintraub et al.<sup>4</sup> Unfortunately, the term “counseling” is vague and it is unclear in many articles what the authors have done. Is counseling advice-giving and therefore provider-centered? Or, is it guided by the needs of the patient, therefore patient-centered and rightfully labeled counseling?

Until the work of Harisson and colleagues in 2003, there has been no study that demonstrated the effectiveness of counseling on dental caries.<sup>5</sup> These researchers trained a lay Vietnamese to provide one-to-one counseling and phone follow-up and visits. Results showed changes in parenting practices and reduction in caries.

Exciting work in the addiction area appeared in the psychological literature in the 1980s. Basically, a nonconfrontational, patient-centered counseling approach was found to be effective with various addictions — alcohol, narcotics, tobacco, etc.<sup>6</sup> Within a decade, brief versions of the technique were used by our colleagues in medicine to impact the behaviors of people who were at risk, usually from the acute stages of multifactorial chronic diseases such as asthma and diabetes.<sup>7-9</sup> The techniques were given an awkward name — motivational interviewing (MI).

### Motivational Interviewing in Dentistry

Weinstein and colleagues reported the initial study of MI in controlling dental disease (caries) in a high-risk population.<sup>10,11</sup> Two-hundred and forty East Indian parents and their 6- to 18- month-old children were recruited and randomly assigned to traditional health education or to an MI intervention provided by trained lay women. Those in the health education condition received a pamphlet and watched a video; those in the MI condition received the pamphlet, watched the video, received MI counseling, and six follow-up phone calls during the first year. There was no intervention the second year. Results for both years showed significant reductions in caries, with the MI intervention showing half the caries of the health education treatment. Two additional studies using MI to control caries were reported. Freudenthal and Bowen used MI counseling with 72 mothers of WIC children.<sup>12</sup> Prepost results suggested positive

changes in toothcleaning and a reduction in the sharing of utensils. Jonsson and colleagues reported using MI strategies as part of a tailored treatment approach to improving the hygiene of periodontal patients.<sup>13</sup>

### How Brief Is Brief MI?

Studies have shown that there are minimal time differences between MI-like counseling approaches and standard medical consultations.<sup>14</sup> One study of primary care physicians found that MI took an average of just under 10 minutes.<sup>15</sup> Even if extra

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time is needed, such time may be well-spent, as these approaches are associated with better outcomes. In clinical medical practice, MI-like approaches are associated with higher levels of patient cooperation, satisfaction, retention, greater physician satisfaction, more accurate diagnosis, and better clinical outcomes than usual care.<sup>16-20</sup>

### MI Principles

Much has been written about MI and its principles. In fact, the literature in both addiction and medicine is burgeoning with many research articles, case histories, books, Internet sites, and training media. While there is some controversy, MI is relatively a theoretical, basically a set of procedures taken from the best practices of counseling/psychotherapy. These practices are based

on a small number of principles. First and foremost is the importance of establishing a therapeutic alliance, a relationship in which the clinician demonstrates genuine concern and the patient feels cared for and understood. This is a collaborative relationship in which the patient's autonomy and choice are respected. Trust is the byproduct of establishing such a connection and is invaluable in influencing the patient to act or change their behaviors.

The second principle complements the first; it is the recognition that people value their independence and are ordinarily reluctant to follow the advice of strangers, even those strangers who have excellent credentials and training. Resistance to recommended change is normal and to be expected. Advice is usually given too early, before the therapeutic alliance is established. "No one cares what you know until they know that you care" (a comment made by a mom debriefed after a MI session).

The third principle enables the first two and has two parts: ask questions and listen. Open-ended questions require the patient to communicate more fully than when responding to questions that can be responded to in a word or two. Moreover, the right questions will trigger patient awareness of the problem and the consequences of not taking action. Listening skills are necessary here.

The fourth principle comes into play when the therapeutic alliance is established and when the patient not only feels understood but is aware of and verbalizes their own needs. At this point, the patient is given the advice to act or change and is given choices that are explored and a course of action tailored to the needs of the patient is developed. Given the multifactorial nature of dental disease, a "menu" with a number of options to explore with the patient is very useful.

The fifth and last principle is that follow-up is essential. MI does not occur only at one point in time. Without subsequent telephone or in-person interaction, no matter how brief, the probability of the patient engaging in desired behaviors to reduce risk becomes less likely.

### MI in Practice

This section will outline an appointment to deliver MI counseling with the mother of a high-risk 2-year-old child and point out other MI tactics.

Dental professional: "Tell me what it like is to be Mary's (Mary is the baby) mom?"

Mother: Mom tells about her motherhood.

Dental professional: "Seems like Mary can be quite a handful and you are worried your mom may not be able to handle her while you return to work. Did I get it right?"

Mother: Mom nods in response to being heard.

Dental professional: "Now tell me about your teeth and the teeth of your family."

Mother: Mom tells her about their teeth.

Dental professional: "Seems you are telling me the teeth of your family have caused much pain and embarrassment."

Mother: Mom agrees.

Dental professional: "Now tell me, if I could give you a dental wish, what would you want for Mary?"

This last question is the mother's motivation to change. Encouraging additional "change talk" (or reinforcing the motivation to change) is very helpful. We want the mother to continue to talk about what she wants for Mary and the costs of inaction. The more she talks the greater the likelihood she will act. So, MI counselors ask additional questions

or comment to trigger and strengthen such talk. "On a 10-point scale how much do you want Mary to ..." Then, "Why did you give me a "10" and not a "six?"

Provide statements of support (affirmations) by using compliments or praise, acknowledging positive personal qualities, competencies or abilities that might promote change; and recognizing previous effort or steps or efforts. "Mom, you took two buses to come here; you are a loving mom and care deeply about the health of your child." Unfortunately such com-

**WHEN THE MOTHER SEEMS  
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ments are rare, as we are quick to criticize or provide advice that feels like criticism and are slow to validate mothers.

Resistance (i.e., arguing) is recognized and explored skillfully, not head on. The counselor responds to negative comments such as, "They are only baby teeth. She'll get another set anyway," with a lack of defensiveness. "Until recently even many dentists did not know that baby teeth were important. Scientists have found if there is an infection in the baby teeth, there will be an infection in the permanent teeth. Remind me what you want for Mary. What will happen if you do nothing?"

While unsolicited, premature advice is not given, when the mother seems to be sufficiently motivated, she is given the opportunity to review options that she can explore that will reduce the risk

of caries for her child. Providing these options in the form of a menu facilitates such exploration. Mothers are encouraged to pick just a few of the options, e.g., toothcleaning, change in diet, bringing the child for biannual application of chemotherapeutics, etc. Counselors are trained to ask about anticipated difficulties. "What will the problems be with" (each choice) and to assist in problem solving.

Confrontation, telling the mother what she has NOT acknowledged or needs to know, do, or accept, is not part of this process. There is no place for a lecturing style in MI.

### Readiness

While not central to the understanding of MI counseling, the concept of readiness plays an important role in MI. Motivation is not a characteristic of the person; it is best thought of as a state of readiness or enthusiasm for change that can vary over time and situations. The concept of readiness may be invoked to help understand both patient and provider behavior. Multiple stages of change are hypothesized by Proshaska and DiClemente.<sup>21,22</sup> The current way of thinking presents five stages of change from earliest to latest: precontemplative, contemplative, preparation, action, and maintenance stages. The author will focus on the first three. The stages are as follows:

*Precontemplative stage.* Precontemplators are those who have no intention of changing a given behavior. People who are in this stage may be unaware that their behavior is a problem, or be aware that it may be a problem, but are unwilling to do anything about it. At times they may have tried unsuccessfully to change their behavior. The problem is viewed as either not worth working on or the probability of success is seen as very small. The status quo is preferable to an attempt at change. At least 40 percent of our population with un-



healthy behaviors are at this stage. Movement from this stage to the next should be seen as a major accomplishment in itself.

For the parent, this may mean she does not think baby teeth are important, worth the effort to protect, or that the family has “soft teeth” and nothing can be done about it.

For the provider, this may mean she does not believe the preventive strategies her practice uses need improvement. Or that changing the behavior of parents with high-risk children has proved impossible, often putting faith in aggressive restorative treatments. Some even believe that restorative treatment alone stops the caries process.

**Contemplative stage.** Contemplators are thinking about making a change. They are unsure. While they are thinking about the benefits (pros) they focus on the costs or negatives (cons) associated with the change. Most every potential change has potential problems.

Contemplators have discomfort with the status quo. Ambivalence is highest at this stage. They are open to information relevant to problem solving.

For the parent, they may believe that preserving baby teeth is important, but see barriers that block change or increase its costs. For example, parents may be unwilling to wean a demanding toddler from the bottle or stop midnight bottle feedings because of disruption or inconvenience.

Similarly, providers may see the change-over to a MI-like strategy to be disruptive, inconvenient, and impractical. They may be concerned about remuneration or believe they do not have the skill set required.

**Preparation/action stage.** They are ready to change and have made personal commitments. The benefits are seen as outweighing the costs of change. A plan is developed and implemented. Both patients and providers have a plan to implement.

## MI Training

There are a growing number of MI trainers who focus on working with addictive behaviors. Training goes beyond providing knowledge and familiarity with MI principles and tactics, and is usually in a workshop setting. Skills must be mastered and the most important (and difficult) skill to master is the skill of active listening.

A workbook has been written to facilitate this training for dental personnel, with versions for public health and pediatric dental settings and versions for general dentists.<sup>23</sup> Recently, Crofoot and colleagues reported that coaching sessions had a positive effect on enhancing the MI skills of second-year hygiene students.<sup>24</sup>

## Conclusion

Brief MI strategies can be readily employed to reduce the risks that dental professionals using CAMBRA uncover. Attention to the motivation and readiness of the patient and/or (parent), and provider are critical in establishing effective risk control programs. ■■■■

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# Changing the Face and Practice of Dentistry: a 10-Year Plan

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**ABSTRACT** Jan. 7 through 9, 2011, the California Dental Association Foundation hosted a symposium on caries management by risk assessment in which a diverse range of stakeholders from across the nation gathered to discuss current and future status of CAMBRA. The consensus of the group was to develop a national strategic plan for CAMBRA implementation which will chart the course to improve the standard in caries disease management within the next decade. This paper represents the initial start of this living document.

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From a bioethical viewpoint, dentistry must seriously contemplate the way it diagnoses and treats dental caries and other oral health issues and make necessary changes based on current scientific evidence. One of the many ethical choices is to move toward a new, more holistic, medically based model for treating the disease process. We must, based on years of research, recognize dental caries as a chronic disease and address it as such. A medically based model of care supports the evaluation of the individual patient's disease indicators and risk factors, and results in a dental care plan that employs protective interventions and nonsurgical treatments, coupled with appropriate minimal restorative procedures where neces-

sary. This shift in patient management embraces established dental best practices and will help establish universally accepted standards of care surrounding the care of patients with dental disease.

The traditional restorative model does not identify or address the causative factors, nor does it alter the disease process itself. As such, dental professionals will need to transition to an evidence-based risk assessment protocol. This will change the accepted practice of dentistry as we know it today. The success or failure of a risk-based caries management program will ultimately be determined by unified participation of organized dentistry, academia, practicing dentists, the insurance industry, and broad patient acceptance.

This document is designed to identify the key stakeholders necessary for success and initiate the process of creating a strategic plan for reaching the ultimate destination in an expedited manner. The ultimate goal is defined as the utilization of CAMBRA (caries management by risk assessment) principles in the management of all patients seeking oral health care. Such a strategic plan should be dynamic, never-ending, and continue to expand concepts, refine, and reinvent procedures.

CAMBRA and MID (minimally invasive dentistry) are prime examples of how this applies to dentistry. If dental providers do not grow, learn, and evolve, the story stops right there. Thankfully, there are still pioneers in the field of dentistry educating through scientific advancement and moving the profession toward innovative concepts and responsible patient care.

A completed SWOT (strengths, weaknesses, opportunities, and threats) analysis of CAMBRA and MID will chart a pathway to achieving this vision. Knowing the starting point and destination allows practitioners and researchers to put the necessary intermediate steps into place.

## Strengths

CAMBRA provides for the accurate diagnosis of the dental caries disease leading to effective management and predictable long term treatment outcomes. This in turn may help increase patient acceptance and satisfaction of their dental treatment which may increase practice success and profitability.

Other strengths to consider are:

- Caries risk assessment identifies those who will most likely need care.
- By lessening the extent and severity

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of disease in those populations, resources may be more readily available to expand access in the general population. This could have major implications on current access to care and work force models.

■ The risk management process could help reverse early disease process (decrease demineralization and increase remineralization) when accompanied by early intervention.

■ Timely intervention will potentially result in improved health outcomes and lower costs both dentally and medically.

■ Improved health outcomes with reduced costs should help reduce access to care issues for individuals in challenging socioeconomic circumstances.

■ Current efforts to reinvigorate the federal dental public health infrastructure are timely for promotion of CAMBRA

as prevention is hailed as the foundation of a successful oral health strategy.

■ Emerging research supports much of the CAMBRA philosophy.

## Weaknesses

Traditional dental practice is based on a restorative model, and culturally, the dental profession continues to focus on repairing the damage caused by dental caries, not on identifying the cause or utilizing preventive interventions. As such, it will take significant effort to change traditional practice models to one that is prevention-oriented.

Other weaknesses include:

■ Current reimbursement strategies are not aligned to allow compensation for the promotion of prevention and nonsurgical treatments. Thus, a viable CAMBRA strategic plan must intentionally include dental health care providers, third-party payers, industry, academia and patients in the change process.

■ Lack of appropriate diagnostic and billing codes inhibit reimbursement and tracking of financial impact of CAMBRA.

■ Only a small percentage of primary dental care providers currently use the CAMBRA concept.

■ There is no coordinated effort by organized dentistry or government agencies to facilitate or mandate the use of CAMBRA or other risk assessment tools.

■ There is a lack of public awareness that dental caries is a chronic disease that is preventable and/or controllable.

■ There are a limited number of demonstration projects supporting efficacy of CAMBRA.

■ There is limited awareness of CAMBRA among pediatricians and other primary care medical providers.

■ Formalized individual risk assessment tools and CAMBRA protocols have not been well-integrated into dental prac-

tice or dental benefit plan designs. When formalized risk assessment tools are not used, caries risk assessment is subjective and dependent upon the current knowledge and skill level of the practitioner.

- A delay in CAMBRA adoption into clinical practice could possibly adversely affect the cost and quality of patient care. The Institute of Medicine estimates that it takes an average of 17 years to integrate new research-based knowledge into routine patient care.

- There are limited evidence-based outcome measurements to track CAMBRA success other than caries lesion development or change.

- There is a lack of high-level confidence that supports best practices in the management of dental carious lesions.

- There is significant subjectivity in caries risk assessment, other than with assessment of caries experience, which allows for considerable variation in assessment and treatment decisions. This is confounded by the fact that there are a limited number of treatment choices with high levels of evidence for the different types of caries lesions we manage (enamel or root, primary or secondary, etc) in different age groups. Thus, developing treatment guidelines that all constituencies will easily accept and embrace is difficult.

## Opportunities

A comprehensive strategic planning process could provide a vehicle for moving CAMBRA concepts into mainstream dentistry on a fast-track basis. A creative process that moves this scientifically based knowledge to the forefront could help improve the population's oral health status, while at the same time address reimbursement and/or other issues that may be of concern to some stakeholders.

Other opportunities include:

- A CAMBRA-based practice will increase the usage of current preventive products and should encourage the development of new products. This may reduce some of the burden placed on the health care system.

- CAMBRA-based prevention and nonsurgical caries management should lead to a shift away from restorative procedures to procedures focused on prevention and early intervention; cost analysis and development of financial models should show the economic value

## CARIES RISK assessment is subjective and dependent upon the current knowledge and skill level of the practitioner.

of CAMBRA-based prevention, which should motivate third-party payers to allocate resources to pay for appropriate and effective individualized patient care.

- New CDT codes for CAMBRA-based prevention or therapy may assist in reimbursement.

- The introduction of CAMBRA into private practice may more fully engage patients in their oral health through education, improved patient experience and reduced cost. Motivational interviewing tools need to be developed as part of an overall CAMBRA program to encourage patient behavioral changes.

- Strong patient advocates may serve to market CAMBRA practices to friends, co-workers and others in the community.

- Prevention counseling and chemotherapeutics will hopefully

change the psychology of the dental professional's messaging style.

- Using a disease management model, benefit companies can enlist the help of the entire health care team for early and vigorous prevention, nonsurgical intervention, and minimally invasive restorative care.

- Finding common ground among providers, purchasers, and patients is a necessary prerequisite for success.

- By enlisting help from the community, public awareness campaigns can strengthen the reputation of dentistry as a whole and draw in new clientele.

- A strategic education agenda promoting the disease management process may increase the number of dental providers utilizing CAMBRA concepts.

- Dental professionals and oral health researchers should be challenged to create educational and marketing resources for increasing medical health care provider awareness about CAMBRA, including attractive literature for patient reception areas.

- Educate the existing dental workforce on ways to evaluate and maintain evidence-based knowledge in cariology and put what is learned into practice, including all personnel: dental hygienists, dental assistants, and office staff. Oral health educators and CAMBRA spokespersons could be trained to organize dental team training and education — to go to where the dentists are.

- Partner with medical, pharmacy, and nursing schools for education on CAMBRA as it relates to systemic disease, prescribing medications, and patients with special needs.

- A best methodology and terminology for classifying all stages of disease progression, along with quantifiable metrics for recording and monitoring the CAMBRA process over time, needs to be developed.

- Create a statement regarding the roles of plaque biofilm, diet, saliva, pH, bacterial testing, and lifestyle habits in the CAMBRA process.

- Create websites for pregnant women, new moms, and caregivers with fast facts about CAMBRA and the need to have a dental visit before the age of 1.

- Create websites and/or blogs and market to appropriate stakeholders to encourage parents to begin asking their dentists about risk assessment. This will create a patient “groundswell” which is an important element of understanding and acceptance of CAMBRA.

- Partnering with appropriate stakeholders for educational program development and training that delivers a consistent and clear message could expedite the acceptance of CAMBRA principles. Stakeholders may include organized dentistry, payers, product manufacturers, educators, academic institutions, medical practitioners, and private dental practitioners. This can include the development of a CAMBRA trademark logo and branding. Dental offices that take an online training course(s) could be awarded a CAMBRA designation; products that are accepted under CAMBRA protocols could be awarded a CAMBRA approved-product designation — furthering the CAMBRA “brand.”

## Threats

Most experts in the CAMBRA approach agree that there are few threats associated with the scientific evidence utilized in this model. The perception that decreasing the amount of caries disease will limit revenues in a restorative-based practice has not been validated, nor has it been ruled out. Studies should be undertaken to evaluate the impact on private practice when CAMBRA strategies are implemented shifting the focus toward prevention and early intervention. Studies

should also determine if there is significant practice growth and case acceptance once the patient oral health is improved.

Metrics must be developed that show CAMBRA improves outcomes and reduces costs for patient populations to gain wide acceptance by third parties, government agencies, and employers.

## Other threats include:

- A degree of mistrust and/or misunderstanding may exist among some health care providers, purchasers,

## CAMBRA REPRESENTS best practices and should become the standard of care in caries disease prevention and treatment.

and patients, where each has a different expectation on how to improve patient health and how financial incentives should be aligned. For example, to the extent that procedure codes do not correctly reflect CAMBRA interventions and dental providers are not adequately compensated, acceptance may languish.

- Some stakeholders perceive that there is lack of transparency in the dental marketplace and incorporation of formalized risk assessment into plan design may be used by third parties to limit benefits.

- Universally applicable diagnostic codes for oral health are not available, making individual risk assessment as well as reimbursement for risk-based procedures under dental benefit plans, and outcomes studies more difficult.

- Patients may not accept CAM-

BRA principles because they do not view the symptoms of caries disease as life-altering or threatening.

## CAMBRA Vision Statement

CAMBRA represents best practices and should become the standard of care in caries disease prevention and treatment.

*CAMBRA Mission Statement:* Promote the CAMBRA philosophy to practitioners and patients through education and collaboration. CAMBRA provides an evidence-based methodology to assess caries disease indicators and risk factors on an individual basis. Results are the basis for an individualized treatment care plan that includes behavioral, chemical, and minimally invasive procedures that are most appropriate for the individual patient.

## The CAMBRA Strategic Plan:

1. Collaborate with existing networks and working groups to increase buy-in and have a unified voice. Examples include:
  - a. National CAMBRA Coalitions (eastern, central and western)
  - b. Cariology Section of American Dental Educators Association (ADEA)
  - c. California Dental Association (CDA)
  - d. Other state dental and dental hygiene associations
  - e. American Dental Association (ADA), Hispanic Dental Association (HDA), and National Dental Association (NDA)
  - f. American Dental Hygienists' Association (ADHA)
  - g. State licensure boards and regional testing agencies
  - h. Dental industry
  - i. Third-party payers
  - j. Department of Health and Human Services Oral Health Initiative (2010)
  - k. Health Resources and Services



Administration funded-Institute of Medicine's Committee on Oral Health Access to Service and Committee on an Oral Health Initiative

- l. Governmental assistance agencies (Medicaid)
- m. Established rural health care networks
2. Expand the network of collaborators and partners to strengthen the CAMBRA movement. Potential new collaborators and partners include:
  - a. European and Asian Cariology education and research groups to promote mutual interests related to assessment, patient care, research, and teaching in the area of cariology
  - b. State public health agencies
  - c. Dentally focused foundations and charities
  - d. OB/GYN associations
  - e. Patient advocacy groups
  - f. Community health centers
  - g. Dental practice management software providers
  - h. Pediatricians
  - i. Medical educators
  - j. Nurse practitioners
  - k. Nursing educators
  - l. Dental journals and periodical publications
3. Refine CAMBRA guidelines and establish protocols in a form that can easily be adopted by the dental office team with little administrative burden.
4. Investigate appropriate data collection systems to monitor outcomes from private practice, health care networks, and dental schools.
5. Develop standards for CAMBRA implementation:
  - a. CAMBRA codes and terminology
  - b. Insurance model and working group
6. Engage and educate the public.

7. Develop education materials for pediatricians, family practitioners, pre-school, elementary schools, employee/patient groups and other public awareness locations.

8. Develop coordinated plans and strategies for increasing the number of dental providers utilizing CAMBRA.

9. Develop interprofessional education models that involve medicine, nursing, and pharmacy to establish what roles each of the other health professionals can and should play in caries prevention.

**IF IMPLEMENTED**  
with unified participation  
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CAMBRA has the potential  
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10. Sponsor demonstration projects to show how the total health care team can impact oral health in relation to caries disease, and how this can affect the overall access to care in dentistry problem.

## Conclusions

CAMBRA is quite possibly the most significant change made to the dental profession in the last century. It represents a transformation in thought, not merely procedure. Without treating the underlying cause of caries disease, tooth repair alone is, at best, scientifically flawed — and, at worst, could be considered as not in the best interest of the patient. CAMBRA is evidence-based (using the scientifically sound principles of the caries balance/imbalance), relatively

simple to do (the caries risk assessment form leads you to a diagnosis and treatment options), has clear scientific advantages over the traditional restorative-only approach (repairing teeth has no effect on the disease), and most importantly poses no known risk to patients. Thus, if implemented with unified participation of all stakeholders, CAMBRA has the potential to change the face of dentistry and relieve the burden on society and individuals of treating the epidemic of dental caries.

This document analyzed the strengths, weaknesses, opportunities, and threats to universal CAMBRA adoption. In this analysis, there are numerous opportunities and strengths that stakeholders can and should build upon. Unfortunately, there are also some identified weaknesses and challenges. However, the only way to address these issues is by working together to find common solutions. There are many areas where consensus can be built. There will always be new advances that different stakeholders will incorporate in diverse ways. However, to avoid repetition and competition between different groups, there is need for unified leadership. This is not about ownership, politics, or power; it is about diminishing and/or eliminating a disease that continues to plague humankind. This document opens the door for dialogue with regard to a vision, mission statement, and a viable strategic plan to begin the process of eradicating, or greatly reducing the incidence of dental caries disease within the next 10 years. This document is a roadmap and a first step in establishing collaborative workgroups to implement evidence-based caries management. After all, those who do not know where they are going will not know when (or if) they arrive.

The oral health of the American population, and for that matter, the world, stands to be improved dramati-

cally if the information currently available is embraced and put into practice. Bold adoption of CAMBRA principles on a widespread scale will be achieved if identified stakeholders cooperate and make the necessary changes to allow these principles to move forward.

This is not a finished document. It should be reviewed and updated regularly. The strengths, weaknesses, opportunities and threats should be revisited. Questions such as, "Are these still strengths of the CAMBRA movement?"; "Have any weaknesses been converted into strengths?"; "Has the environment changed with

regard to opportunities and threats?"; "Are opportunities still valid and are they being taken advantage of?"; and "Have threats been eliminated or diminished?"

This paper is a call to action to complete, periodically revise, and continuously improve the CAMBRA strategic plan. From this plan, broad goals will be established for the next 10 years. Specific items should be grouped together to simplify the process and maximize results. Definitive short-term goals should be made for the next 12, 24, and 36 months. Individual teams will be given responsibility for at least three to five definitive goals for each

time period. When a goal is met, it should be celebrated. Then, another goal can be put in its place. The only way to complete the task of eliminating or significantly reducing the burden of caries disease in the next 10 years is to start the journey.

If you are in a position to help, please contact the author. ■■■■

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- ❖ **SOUTH LAKE TAHOE** - For Lease. 5 ops. Not equipped. No upgrades or additions needed. Call for details.
- ❖ **DUNSMUIR - SHASTA** - Dental office bldg for sale. Call for referral.
- ❖ **CENTRAL VALLEY** - 3 ops., collections \$725K. **PENDING**

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**OFFICE FOR LEASE** — Five operatory dental practice for lease. Please call for details, 818-758-3557.

**SPACE AVAILABLE FOR RENT** — SF Bay Area North. 750-5,000 sq. ft. of existing dental office. Very reasonable. Inquiries 707-994-1218.

**OFFICES FOR SALE**

**MODERN FOUR OPERATORY DENTAL BUILDING IN DUNSMUIR FOR SALE OR LEASE** — A beautiful mountain setting in Northern California with hunting, fishing and skiing. Building well maintained. Seller motivated, all terms negotiable. Seller would consider forgiving lease/sale payments for first year to help practitioner establish a practice. Present dentist moving out in order to reduce commute driving time. Contact seller at [mollyruss@sbcglobal.net](mailto:mollyruss@sbcglobal.net) or Doris Moss Realty, Brett Waite, Broker, 530-926-3807 or [brett@mtshastarealty.com](mailto:brett@mtshastarealty.com).

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# WESTERN PRACTICE SALES

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## BAY AREA

**A-8941 SAN FRANCISCO—** Move-In Ready! Two Fully Equipped ops/plumbed for 1 add'l Only **\$65k**

**A-9991 SAN BRUNO** - Facility- Ready to Move in Perfect for GP or Specialist! 1,500 sf w/3 ops and plumbed for 1 add'l Only **\$69.5k**

**B-9791 OAKLAND** Historic building in heart of downtown w/in blocks of the financial, commercial district. 2,050 sf w/ 4 fully equipped ops **\$275k**

**B-9851 SAN RAMON Facility—**This remarkable opportunity will not wait for the hesitant buyer! Office ~ 1,700sf w/ 3+ ops **\$219k**

**B-990 SAN LEANDRO—** Hesitate and this quality, fee-for-service practice will be gone! Strong and loyal patient base. Just 1 block from the bustling heart of town. 800 sf w/ 3 ops **\$398k**

**B-9941 Central Contra Costa—**Stellar reputation - Strong, loyal patient base. 863 sf w/3 ops **\$675k**

**C-8901 SANTA ROSA—** Residential area. 40+ new pats/mo. Highly Visible! 1291sf & 3 + 1 op. **\$468k**

**C-976 PETALUMA—**Prestigious area! ~ 800 sf w/2 fully equipped ops **\$350k**

**C-989 SANTA ROSA** - Foot traffic generates new patients & continuous growth for this modernly equipped office. ~ 2,500sf w/ 5ops. **\$325k**

**D-877 LOS ALTOS** -Pristine Professional plaza. Office is ~ 2,400sf - 6 ops **2009 Collections - \$819k!! Reduced to \$350k to offset rent amount**

**D-9091 ATHERTON** -Turnkey operation 969 sf & 3 ops *Call for Details!*

**D-960 Facility only SAN JOSE** - *Reasonable rent and great lease. Opportunity to purchase condo suite also!* 1,158sf w/3 ops **\$85k**

**D-965 WATSONVILLE** - Office ~ 2,400 sf, w/ 4 equipped ops + plumbed for 4 add'l ops. **\$420k**

**D-967 SAN JOSE – FACILITY—** Beautiful! Office ~1,600+ sf w/ 4 ops **Only \$135k Seller fin. avail. to qualified buyer w/10% down!**

**D-977 SAN JOSE FACILITY** —Nicely equipped, Office ~ 1,100sf w/ 4 fully ops **\$150k**

**D-982 SUNNYVALE Facility** - 2 ops & space to add an add'l op & business office - Rent only \$1,750 including triple-net! **\$128k**

**D-1003 CENTRAL CONTRA COSTA CO** - Quality practice with a wonderful patient base! 1,550 sf w/ 4 fully equipped ops **\$575k**

## BAY AREA CONTINUED

**D-991 SANTA CRUZ—Practice by the beach! Large, stable patient base.** 2-story Medical/Dental Bldg - highly desirable area. 1,050 sf w/ 3 ops + plumbed for more! **\$195k**

**D-9921 SANTA CRUZ CO** - Professional center, good design for patient flow. 1,140 sf w/3 ops **\$225k**

**D-997 SAN JOSE** - Well established, Predominantly FFS practice. ~ 1,008 sf w/ 4 ops. **\$230k**

## NORTHERN CALIFORNIA

**E-729 AUBURN** - Busy retail shp ctr w/excellent signage. 1750sf, 4ops. Plumbed for 2 add'l ops **\$250k**

**E-8641 SACRAMENTO-FACILITY** - 2,100+ sf w/ 3 ops & plumbed for 1 add'l **\$50k**

**E-969 FAIR OAKS** Everyday will be a joy to come to work. Office is ~ 600sf w/2 ops. **\$250k**

**E-995 ELK GROVE** -Quality, FFS practice. \$900k+ in 2010! Doctor avg 8 pats w/ 12 Hygiene patients per day. ~1,692sf w/ 5 ops. **\$600k R.E. \$375k**

**E-1007 ELK GROVE—** Great Location with excellent signage and visibility. ~800sf w/ 3ops **\$200K**

**G-875 YUBA CITY—**Estab. 30 + years, GP, FFS, 3,575sf /9 ops, great location. **\$1.63m w/Cerec ~ Assoc Buy-In Op!**

**G-883 CHICO VICINITY**—Quality FFS GP. Attractive Prof Plaza. 1,990 sf w/ 5 ops **\$495k**

**G-998-CHICO/PARADISE—**Surrounded by breathtaking natural beauty! ~898sf, 3 ops. **\$275k**

**H-856 SOUTH LAKE TAHOE** Over 50 new patients/mo Respected & Growing! 1568 sf & 4 ops **\$325k**

## SOUTHERN CALIFORNIA

**K-986 NEWPORT BEACH** - If living by the beach in Orange County is your dream, then look no further! Attractive, multi-story Medical/Dental Professional building. 1,000 sf w/2 fully equipped ops + 1 hyg op **\$195k**

## CENTRAL VALLEY

**I-945 TRACY** - Young, growing, highly motivated patient base. 1,300 sf & 4 ops **\$350k**

## CENTRAL VALLEY CONTINUED

**I-923 MODESTO—**1495sf/ 4op+1, Newer, All digital. **\$310k**

**I-966 MODESTO - Facility** Newly renovated, w/ prof. décor and floor plan~ 700sf w/2 ops, **\$89k**

**I-9721 STOCKTON** -Prof. building complex on major thoroughfare. 1,450 sf w/3 ops & plumbed for 1 add'l op. **\$75k. Partial Bldg Buy-out available**

**I-974 MODESTO FACILITY** - Dent. Prof. Bldg. Reasonable rent/Great lease. Newly Remodeled! ~ 950sf w/3 fully equipped ops **\$99k**

**I-996 MERCED-** Located in the "gateway" to the spectacular Yosemite National Park! Desirable area in Heart of Town! 1,450 sf w/ 3 ops **\$170k**

**I-1005 SAN JOAQUIN VALLEY** - Seller Retiring. Long-established High-End Restorative Practice. 2,500+ sf w/ 6 fully equipped ops **\$650k**

**I-1012 MANTECA** - Location, growth & high profitability! Well equipped w/ high-tech amenities! 780 sf w/2 ops **\$479k**

**J-1000 TULARE—** *Real Estate Available too!* Great highly visible location! ~ 1650sf w/ 4op. **\$349k and R.E. \$249k**

**J-1001 LINDSEY—** All American City! Conveniently located ~ 3,380sf w/5 ops **\$325k**

**J-928 ATWATER** - Established & respected for gentle treatment. Prof Bldg in desirable area. 1,313 sf w/3 spacious ops **\$230k**

## SPECIALTY PRACTICES

**I-7861 CTRL VLY ORTHO-** 2,000sf, open bay w/8 chairs. FFS. 60-70 patients/day. Prof Plaza. **\$370k**

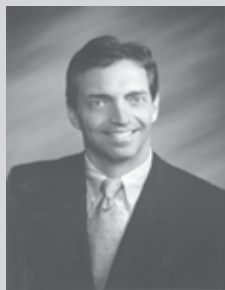
**D-892 MORGAN HILL ORTHO-** Remarkable Oppty! Floor to Ceiling windows—wooded courtyard. 1900sf & 6 chairs in open bay. **\$275k**

**I-9461 CENTRAL VALLEY/ORTHO** - Strong referral base and happy patients! ~ 1,650 sf w/5 chairs/bays + (2) add'l plumbed. **\$140k**

**E-980 SACRAMENTO VICINITY ORTHO—** *4 for the price of 1!* Sold as cluster of satellite offices in multiple locations, grab this w/ no regrets! **\$1.5M**

**J-983 CENTRAL VALLEY ORTHO** - Practice focuses on service and comfort! Attractive, single-story building. ~1,773sf w/ 6 chairs/bays. **\$325k**

**G-975 CHICO ORTHO—**Providing quality qualify-ing Denti-Cal patient base. ~ 900 sf w/ 2 + ops. **\$90k**



Timothy G. Giroux, DDS



Jon B. Noble, MBA



Mona Chang, DDS



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- **BARSTOW:** *For Sale-General Dentistry Practice.* Gross Receipts \$395K with an adjusted net income of \$193K. Office consists of 1,100 sq. ft. 4 operatories. Intra-Oral Camera, Dentisoft. There are 3-hygiene days per week. Practice has been in its present location for the past 25 1/2 years. **SOLD**
- **CORONADO:** *For Sale-General Dentistry Practice.* Gross Receipts in 2010 \$405K. Office space 1,400 sq. ft., 4 operatories, Laser, Intra-Oral Camera. 1,000 active patients. 2 hygiene days a week. Practice has operated in its present location for 40+ years. Owner retiring. #14366
- **EL DORADO HILLS:** *For Sale-General Dentistry Practice.* 2009 GR \$790,758, adjusted net income of \$312K. Intra-oral camera, pano, Softdent software, 4-equipped ops. 6-hygiene days. Practice has been in its present location for past 18 years. Owner retiring. **SOLD**
- **EL DORADO HILLS:** *For Sale-General dentistry practice.* Gross Receipts of \$834K with adj net of \$389K, 53% overhead. Office has five equipped operatories in 1485 sq.ft. Pano, Intra-oral Camera, Dentrix, 5 days of hygiene. Owner retiring. **SOLD**
- **FOLSOM:** *For Sale-General Dentistry Practice.* Gross Receipts in 2010 were \$703K with an adjusted net income of \$300K. 5 days of hygiene and approx 1500 active patients. Leased Office is 2,000 sq ft with 4 equipped operatories-5 possible. Patient Base software. Owner to retire. **SOLD**
- **FOLSOM:** *For Sale-General Dentistry Practice* 2009 Collections \$513K. Adjusted net income \$184K. 4 ops (plumbed for 5), Intra-oral camera, fiber optics in all ops. Patient base software. Owner retiring. **SOLD**
- **FOLSOM:** *For Sale-General Dentistry Practice.* Gross Receipts in excess of 1.5M the past three years. Adjusted Net of \$550K. 2,700 sq. ft. office with 7 ops. Digital, Dentrix, Intra-Oral Camera, Laser, 5+year old equipment, 8 days hygiene. Beautiful office, great location. Owner retiring. #14336 **SOLD**
- **FRESNO:** *For Sale-General Dentistry IV Sedation Practice.* (MERGER OPPORTUNITY) Owner would like to merge his practice into another high quality general dentistry or IV sedation practice. The merger would be into Buyers office. Seller would like to continue to work as either a partner or associate after the merger. 2010 collections were \$993K with a \$422K adjusted net income. There are 7 days of hygiene. #14250. **SOLD**
- **GRASS VALLEY:** *For Sale-General Dentistry Practice.* 2009 GR of \$307,590 (3 days/wk) with adjusted net income of \$105K. 3 Ops. refers out most/all Ortho. Perio, Endo, Surgery.

Intra-Oral Camera, Diagnodent, EZ Dental Software. Good Location. Owner retiring. #14337.

- **GRASS VALLEY:** *For Sale-General Dentistry Practice.* Owner retiring. Gross Receipts \$89K. Practice has been in the same location for the past 33 years. 2 equipped operatories, 3-4 available. Panoramic X-ray. Doctor owns building, which is available for purchase. This practice can also be combined with another Grass Valley practice also listed for sale. #14362.
- **GREATER CHICO:** *For Sale-General Dentistry Practice.* Gross receipts in 2010 were \$584K, with an adjusted net income of \$152K. Approx 1,100 active patients. 4 operatories, Pano, Intra-Oral Camera. Easy dental software. Leased office 1,200 sq. ft. Owner is retiring. #14359.
- **GREATER FAIR OAKS-SUNRISE AREA:** *For Sale-Gross Receipts in excess of \$1.1 Million dollars for the past three years. Adjusted net \$450K. 2,400 sq ft office-5 ops. Hygiene days-6, Owner works 32 hours per week. Eagle Soft, Laser, Pano Intra-Oral Camera, fiber optics. Owner retiring. #14343* **SOLD**
- **GREATER SACRAMENTO:** *For Sale-Pediatric Practice.* 2010 GR of \$1,095,914, with a 35% overhead. Prevention oriented practice with 1,600 sq. ft. Digital office with Dentrix. Equipment is nine years old. Delta Premier is only insurance. Owner retiring. **SOLD**
- **GREATER SAN JOSE AREA:** *For Sale-General Endodontic Practice.* 2009 Collections were \$1,187MIL with an adjusted net income of \$696K. There are 4 ops in this nicely decorated 1,400 sq ft office space. 4 microscopes. Owner has been in same location for 26 years with long-term employees. Owner is retiring but will continue to work 1 1/2 to 2 years through the transition with the buyer. **SOLD**
- **HAWAII (MAUI):** *For Sale-General dentistry practice.* Gross Receipts of \$636K. Office has four equipped operatories in 1198 sq.ft. Pano, Laser, I.O. Camera, Fiber Optics, 2 1/2 days of hygiene. Owner retiring. Don't miss this opportunity to live and work in paradise. #20101
- **IRVINE & COSTA MESA:** *For Sale-General Dentistry practice combined.* Gross receipts combined \$781K with adjusted net of \$396K. Both office spaces are leased with 4-5 ops in each. Both are 1,600 sq. ft. Irvine is equipped with Intra-Oral Camera, Pano & Dentrix. Costa Mesa is equipped with Laser, Intra-Oral Camera, Pano and Dentrix. #14355.

- **LAGUNA NIGUEL:** *For Sale-General Dentistry Practice.* 2010 gross receipts were \$503k. 4 operatories, Pan, computerized with EZ dental software. 1,500 sq. ft. lease. 10 years in present location. Owner retiring. #14352
- **LAKE COUNTY:** *For Sale-General Dentistry Practice.* Gross Receipts 904K with adjusted net \$302K. Practice has been in same location for past 23 yrs, and 25 yrs in previous location. 2,600 sq ft with 8 equipped treatment rooms. Intra-Oral Camera, Pano, and Data Con software. Owner to retire. #14338
- **LINDSAY:** *For Sale-General Dentistry Practice & building.* Gross Receipts in 2010 \$330K with adjusted net income of \$219K. Owner has operated in present location for 27 years. Office space 1,489 sq. ft., 3 operatories available (2 equipped), Intra-Oral Camera, Soft-Dent software. 3-hygiene days a week. Owner retiring. #14363.
- **LIVERMORE:** *For Sale-General Dentistry Practice.* 2009 Collections were \$688K with an adjusted net income of \$287K. There are 4 ops in this nicely decorated 1,082 sq. ft. office space. Dentrix software, 6-days/wk hygiene. Owner has been in same location for 36 years with long-term employees. Owner is retiring. #14326 **SOLD**
- **LOS ANGELES:** *For Sale-General Dentistry Practice.* 1,200 sq ft 4ops, 29 yrs in present location. Gross Receipts \$274K with adjusted net income of \$89K. Owner to retire. #14348
- **MARIN COUNTY:** *For Sale-General Dentistry Practice.* This is a small 650 sq.ft. office with three treatment rooms. The practice has a very low overhead of only 48%. 2010 gross receipts were \$179,000 with \$90,000 adjusted net. Practice includes Panoramic X-ray and Easy Dental Software. Refers out O.S., Perio., & Endo. Practice has been in its present location for 30 years. This is an ideal practice for the new grad or satellite practice for the established dentist. Owner is retiring. #14370
- **MODESTO:** *For Sale-General Dentistry Practice.* 5 operatories, 32-years in practice. Gross Receipts \$884K w/adjusted net income of \$346. Dentrix, Laser, and Intra-Oral Camera. Owner to retire. #14308 **SOLD**
- **NAPA:** *For Sale-General Dentistry Practice.* Gross Receipts \$800K, with adjusted net income of \$250K. Fee for Service. 1300 sq ft 4 ops 6 hygiene days 38 yrs in present location, 30 yrs in previous location. Owner to retire. **SOLD**
- **NEWPORT BEACH:** *For Sale-General Dentistry Practice.* Practice has operated at its present location since 1986. Located in a highly affluent Newport Beach community. Three (3)

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hygiene days per week. Leased office space with 4 ops. in 1,450 sq. ft. Pano & Practice Works software. #14354.

• **NORTHERN FRESNO:** For Sale-General Dentistry Practice. This is a perfect starter or satellite practice. Excellent location in North Fresno. Gross Receipts in 2010 were \$173K. Approximately 450 active patients. 3 operatories. Dentrix software. Leased office 1,200 sq. ft. Owner has been accepted to an Endodontic Residency after starting practice 1 1/2 years ago.

• **NORTHERN CALIFORNIA:** For Sale-Endodontic Practice. This Endodontic practice is located in an upscale professional office complex. The owners condominium occupies 1,770 sq. ft. There are 4 equipped treatment rooms with an additional 5th room available. Gross Receipts were \$638K with \$239K adjusted net income. Owner will stay for transition to introduce buyer. Owner is retiring. #14251

• **NORTHERN CALIFORNIA:** For Sale-Pediatric practice. Owner has operated in same location for 32 years. Approx 1,760 active pts, 1,160 sq. ft. Panoramic X-Ray, Dexis Digital and Dentrix software in this 5-chair office. 2009 Gross Receipts \$713K with 48% overhead. Owner retiring. Call for Details.

• **OCEANSIDE:** For Sale-Modern looking office. 4 op, office space and equipment only. Belmont chairs. Gendex x-ray system, intraoral camera, approx 1200 sq. ft. Low overhead-Rent is \$1,900/month, and it's a 5 year lease. Staff is available for rehire-front desk \$15/hr, assistant 13/hr. Update all the computer systems after purchasing the office in 07. Computers and monitors in every room. #14346

• **PLEASANTON:** For Sale-General Dentistry Practice. Owner has other practice in Bay Area only in Pleasanton 1 day/wk. 300 active patients. Excellent location-beautiful 1600 sq.ft. 5-op office. Equipment like new, intra-oral camera, pano, Easy Dental software. Must See. #14364.

• **PLUMAS COUNTY:** For Sale-3 equipped ops. Space available for 4th op. 1,245 sf office in good location. Gross Receipts \$475K. Practice in present location over 50 years. Owner is retiring. #14318

• **REDDING:** For Sale-Owner looking for Assoc. trans. into Partnership w/Buy-Out. GR \$1 Million dollars income \$436K. 5.5 days hygiene, 2,200 sq. ft. #14293

• **RENO:** For Sale-General Dentistry Practice and Dental Building: 2009 Gross Receipts \$550K with adjusted net income of \$165K. 4 1/2 hygiene days/week. 1,800 sq. ft. with 6 equipped ops. (7 Avail). Dentrix software, Pano. Practice has been in its

present location for 40 years. Owner retiring

• **ROCKLIN:** For Sale-General Dentistry Practice. Gross Receipts \$593K in 2010 with \$240K adjusted net income. Office is 1,630 sq. ft., with 4 operatories equipped with fiber optics. Owner has been in present location for the past 13 years. 3 1/2 days hygiene. Intra-Oral Camera, Dentrix software. Owner to retire.

• **ROSEVILLE:** For Sale-General Dentistry Practice. Great Location. 2009 GR \$900K with adjusted net income of \$300K. 1,975 sq. ft. with 4 operatories, 5 days hygiene/wk. Digital, Intra-Oral Camera, Dentrix, Trojan, fiber optics, P & C chairs - all less than 5 years old. Owner is retiring. #14327

• **SACRAMENTO/ROSEVILLE:** For Sale-One of many partners is retiring in this highly successful General Dentistry Group Practice. Intra-Oral Camera, Digital Pano-Dexis, electronic charts, owner Financing. Call for further information. #14334

• **SAN DIEGO:** For Sale-General Dentistry practice. Gross Receipts \$414K. Practice has been operated by the same owner for the past 6 years. Leased 950 sq. ft. office with 3 equipped operatories. Dentix software, Intra-Oral camera, Panoramic X-Ray. Owner to relocate. #14356.

• **SAN DIEGO:** For Sale-General Dentistry Practice. 6 ops, Intra-Oral camera, Eagle Soft Software. Office square feet 2,300 with 3 years remaining on lease. 2009 Gross Receipts \$1,448,520, with an adjusted net income of \$545K. Doctor would like to phase out then retire. #14331

• **SANTA BARBARA:** For Sale-General Dentistry Practice. This excellent practice's 2009 gross Receipts \$891K with steady increase every year. Practice has 6 days of hygiene. 1,690 sq. ft., 5 ops, Laser, Intra-Oral Camera, Schick Digital X-Ray, Datacan software. Doctor has been practice in same location for the past eleven years of his 31 years in Santa Barbara. Doctor is retiring. #14333

• **SAN LUIS OBISPO:** For Sale-Two Doctor General Dentistry Practice. Gross receipts \$1,537,142 for 2010 with an adjusted net income of \$691K. The office has 2,331 sq. ft. with 8 equipped operatories. Pano, E4D, and Dentrix software. Practice started in 1990 and has been in its present location since 1998. Approx. 3000 active patients. Great location with nice views. #14353.

• **SANTA CLARA:** For Sale-BUILDING ONLY: This building is located just west of Westfield Mall and Santana Row. The building has two units. One side is designed and plumbed for dentistry and the other was a law office. There is 3,776 sq. ft. of office space. The dental office is approximately 2,500 sq. ft. with 6 operatories. The building is presently being re-roofed. Excellent opportunity for a startup practice or for the dentist that needs more space. Financing available through various dental lenders. #14368

• **SANTA CRUZ:** For Sale-General Dentistry practice. Gross Receipts \$300K with a 57% overhead. Office is 1,140 sq. ft. 3 equipped operatories. Intra-Oral Camera, Pano, Digital X-Rays, and Dentrix software. Practice has been in its present location since 1980. Owner retiring.

• **SANTA CRUZ:** For Sale-General Dentistry practice. This excellent practice is centrally located in a professional complex. Office is approx. 1,885 sq. ft., 4 operatories with room for one additional. There are approx. 2000 active patients with 6 days of hygiene per week. Practice Pano, Intra-Oral Camera and Easy Dental software. Owner is retiring. Reasonable lease available. #14361

• **TORRANCE:** For Sale-General Dentistry practice. This excellent practice is centrally located in a professional complex. Office is approx. 1,885 sq. ft., 4 operatories with room for one additional. There are approx. 2000 active patients with 6 days of hygiene per week. Practice Pano, Intra-Oral Camera and Easy Dental software. Owner is retiring. Reasonable lease available. #14320

• **TORRANCE:** For Sale-General Dentistry Practice. Gross Receipts \$413K with an adjusted net income of \$203K. 50% overhead. Practice has been in its present location for the past 25 years. The office has been tastefully remodeled. Office is 800+ sq. ft. with 3 equipped operatories. 4 -hygiene days per week. Doctor is to retire. #14369

• **TRACY:** For Sale-Equipment, furnishings, and leaseholds only. In the Central Valley. Fully equipped including 4 Belmont Accutrac chairs, 2 Midmark chairs, 6 DCI rear delivery units, 3 Gendex x-ray units, 1 Softex digital x-ray processor, 1 Statim 5000, 1 Harvey autoclave. 2,800 Sq ft, 6 Ops. New lease available from landlord.

• **VISALIA:** For Sale-General Dentistry Practice. Gross Receipts \$616K with an adjusted net income of \$321K. Office is 1,380 sq ft with 3 equipped operatories. Intra-Oral Camera, Digital X-Rays, Mogo software, Equipment & leaseholds look new. 5 years in present location. Owner to relocate. #14347

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bright, energetic with a desire to be productive, very personable, people oriented and have great general and specialty clinical skills, please fax resume to Otto J. Hanssen at 425-484-2110.

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**OFFERED FOR ARIZONA —** Immediate need for a FT Dentist willing to relocate to Glendale Arizona. The office has a steady patient flow, FT Hygienist and excellent earning potential. Doctor must have 3-5 years experience and be proficient in molar endo. Benefits package offered including Malpractice coverage. Please contact Kristin Armenta at 714-428-1305 or fax to 714-460-8564.

**SEEKING LEAD DENTIST —** Modesto Bright Now! affiliated dental office has a full-time position available. Requires 3 - 5 years experience, must be proficient in molar endo and surgical extractions. This opportunity offers the safety and security of a large group practice with a robust patient base. The office has a fantastic potential to do a substantial amount of production and the professional staff allows a doctor to focus solely on dentistry. Help us with our mission to promote Smiles for Everyone. Please submit your resume to [jobs.smilebrands.com/careers](mailto:jobs.smilebrands.com/careers) or email your resume to [sherrie.dean@smilebrands.com](mailto:sherrie.dean@smilebrands.com). A comprehensive benefits package is offered for full-time positions, which includes:

CONTINUES ON 760

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### 3060 SACRAMENTO COUNTY GP

General & Cosmetic practice located in the charming, picturesque town known as "The Jewell of Sacramento County". For those who enjoy cycling, running and other outdoor activities. The American River parkway winds through this town and can be ridden all the way to Folsom Lake.

Beautifully & thoughtfully designed, this well appointed office has 6 fully equipped ops with state-of-the-art equipment and facility. The practice is located in a single occupancy, free standing, single story professional building of approximately 2,000 sq. ft. The building's lot has ample on-site parking and is located on a major thoroughfare with fantastic visibility. Approximately 1,500 current/active patients (all fee-for-service) with an estimated 16 new patients a month. 2010 GR \$1.6M with an adjusted net income of almost \$500K. Asking price \$1,105,000.

### 3059 SANTA CRUZ COUNTY GP & BDG

Charming practice tucked among soaring redwoods in Santa Cruz County. Located in a single level professional building in the heart of town. Well established and part of the small community landscape. 2010 GR \$595K+ w/3 doctor days. All fee-for-service. Owner retiring and willing to help for a smooth transition. This is a great turn key practice and opportunity to own a hidden gem. Practice asking price \$373K, building is also available.

### 3006 MONTEREY COUNTY ORTHO

Est. Ortho practice in 2,668 sq. ft. office with 5 open bay chairs in a professional dental complex. Panorex and Cephalometric X-ray machines. Stable and loyal referral base. Annualized GR as of Oct 2009 are \$335K+. Owner retiring and willing to help for a smooth transition. Asking 227K.

### 3061 SAN JOSE ORTHO FACILITY

Located in desirable Evergreen area in a two-story, handicap accessible, high profile, medical and professional building. Gross lease with utilities included expires July 2013 with 5 year option to renew. Modern, tastefully designed, approximately 1,321 square feet. Office space includes: fully-equipped open bay with bay support cabinets and 4 chairs setup for right-handed delivery, exam/consult room with patient chair, reception area, private office, business office, lab area, sterilization area, and bulk storage area. Asking \$95K.

### 3049 SAN JOSE GP

Well-located, across from O'Connor Hospital, general practice in 2,118 sq. ft. state-of-the-art facility w/ 3 fully-equipped ops. 2 pvt. offices (1 can be plumbed for 4th op.). This office is beautifully designed and is stunning. In addition to his general practice, owner treats sleep apnea patients. He is selling just the general operative portion of the practice and is willing to help for a smooth transition. Ideal for an experienced dentists looking to merge an existing practice. Asking \$285K.

### 3045 VACAVILLE GP

Turn-key, traditional dental practice with loyal staff and sense of community. Well maintained 900 sq. ft. tastefully decorated office with 2 fully-equipped ops. 2010 GR 224K+, 2010 projected GR as of Aug. \$270K+ with 50% avg. overhead. Owner retiring and willing to help for a smooth transition. Asking \$172K.

### 3057 SAN JOSE GP

Priced to sell. Located in 2 story professional building w/3 fully-equipped ops. in 990 sq. ft. office. Part of historic Rose Garden neighborhood, block from the Alameda, & near a well travelled intersection. Seller transitioning due to health reasons. FY 2010 GR \$415K. Asking Price \$120K.

### 3052 PETALUMA GP

Well-established 3 Dr. day practice in 2,268 sq. ft. office w/6 ops. Avg. gross receipts for past 3 years \$315K. Located just a mile from the Petaluma River in the historic town of Petaluma. Conveniently located 32 miles north of SF in the Sonoma County Wine Country. Bldg. is available for purchase. Ideal for merging with an existing practice in the area. Owner retiring and willing to help for a smooth transition. Asking \$145K.

**Upcoming: San Jose GP & Fremont GP**



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malpractice coverage and competitive pay! For available positions please call: 714-428-1305, submit your resume to [kristin.armenta@smilebrands.com](mailto:kristin.armenta@smilebrands.com) or fax to 714-460-8564.

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# Professional Practice Sales of The Great West

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*If you want your practice "For Sale", we are not the firm for you.*

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- 5999 "SOLD" PLEASANTON** Adjacent to Hacienda Business Park. 2011 tracking \$900,000. Strong profits. Digital radiography with computers in Ops. Great visibility.
- 6002 SAN JOSE'S EVERGREEN VALLEY - FILIPINO PRACTICE** Near Highway 101 and East Capitol Expressway. Housed in new building and suite. Busy Hygiene schedule. 2011 tracking \$850,000. Strong profits.
- 6003 "SOLD" PINOLE - HERCULES AREA** 4-days of Hygiene. 90%+ effective Recall. Produced \$740,000 and collected \$709,500. Low AR balance. Endo referred.
- 6004 "SOLD" SAN JOSE'S SANTA TERESA AREA** Asking slightly more than what it would cost to replicate this office today. Digital & paperless 3-Op suite. 2010 produced \$385,000 with collections of \$277,000 and Profits of \$190,000+. Gorgeous facility. Lease allows occupancy thru 9/30/2024.
- 6008 MENDOCINO COAST - FORT BRAGG** Nestled in desirable cultural haven creates attractive lifestyle. 4-days of Hygiene. 2010 collected \$695,000. Owner works 3-day week and states he could work more if desired. Computerized Ops and digital radiography.
- 6010 "SOLD" BERKELEY - ALTA BATES MEDICAL VILLAGE** Attractive revenues. Last 2-years Profits have averaged \$225,000. 2011 doing better!
- 6011 "SOLD" SAN JOSE - WEST OF I-280** Long established practice off Saratoga Avenue. Has averaged \$400,000 per year in collections. 3-Ops with 4th available in 1,000 sq. ft. suite.
- 6012 "SOLD" FREMONT** Well established practice as evidenced by 6+ days of Hygiene. Fantastic Recall System. Great location. Collects just shy of \$900,000 per year. Total Available Profits in 2010 were \$360,000. 5-Ops.
- 6013 LIVERMORE** Not yet 4-years old, tracking \$430,000+ in collections 2011. Attractive 4-Op suite fully networked, employs computer charting and digital radiography.
- 6014 SAN FRANCISCO** Located in "Heart" of the Mission. Owner does not speak Spanish. 2011 tracking \$425,000+ with \$185,000 in Profits on 3-day week. 3-Ops. Great opportunity for Successor who shall devote more attention. Building has private garage for tenants.

*For complete details on any of these opportunities, go to [www.PPSsellsDDS.com](http://www.PPSsellsDDS.com)*

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Thinking on selling your practice? Call "PPS of The Great West" today.  
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*"I listed with a competitor for 12 months. Had two people visit my practice. First weekend PPS had my listing, I had 3 people visit and an offer by the end of the first week. Thank you for allowing me to move on to the next step of my life."*

*"It was a pleasure to work with PPS. I had to sell because of health complications. Mr. Irving listed my practice on Jan 1st, we closed escrow on Feb 27th. It took him less than 60 days to complete the sale as promised."*

*"When I decided to sell my ortho practice, I sought the services of a large company. Over the 12-month contract, I had one buyer visit. Word was out. It had a devastating effect on my bottom line. Fortunately, I found Ray and Edna Irving! When I finally sold, I choose between two good offers. My regret was the time and money lost with the other guys."*

*"When I signed the Listing on June 1st, Ray stated he would have the practice sold by Labor Day. The sale was concluded on Sept 1st, two days before Labor Day. Wow!"*

*"I will always remember your statement when I questioned your contract being only four months. You stated: 'If I can't sell your practice in that time, you should get someone else.' Well, you did with time to spare!"*

*"Before I called Ray, I had a listing with another prominent Broker. After eleven months without a sale, I called Ray. He sold it in about a month! Would I recommend Ray? Yes!"*

*"In April, I asked Ray Irving to sell my practice. At the same time my friend decided to sell his practice. He employed another firm. My practice sold June 22. My friend's practice still hasn't sold and he was putting his dreams on hold."*

PPS of The Great West's reputation is built upon grounded ethics and effectiveness. Our trademark "client services" include accurate assessments, impeccable marketing plans, complete transparency, generating quick responses, realizing multiple Offers, securing 100%+ financing in days, expert papering of our transactions and sound counsel. Everything is done to protect our Client and to effect a successful transfer. Our intent is simply to provide the best service imaginable for this very important engagement.



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**Paul Maimone**  
Broker/Owner

**BAKERSFIELD #21** - (10) op G.P. & Bldg. on a main St. (3) ops fully eq't'd. (3) ops part eq't'd & (4) add. Plmbd. Store front. Collects ~\$500K/yr. Cash/Ins/PPO/small % Denti-Cal. **NEW**

**BAKERSFIELD #22** - (5) op G.P. (4) eq't'd. Strip center location with exposure & signage. Collects ~\$200K/yr p.t. Next to medical clinic & WIC. Can collect much more w/ more hours.

**BAKERSFIELD #24** - (4) op computerized G.P. 2 ops eq't'd w/ 2 additional plumbed not eq't'd. Cash/Ins/PPO pt. base. Collect \$200K+/yr. 3-4 days/wk. In a strip ctr. Seller retiring.

**CENTRAL VALLEY/So. FRESNO CTY.** - (3) op compt. G.P. Newer eq't., digital x-rays & Dentrux s/w. Limited competition. Cash/Ins/PPO. New bldg out in 2009. **PENDING**

**COVINA DUPLEX BLDG. & PRACTICE** - (4) op comput. G.P. & Duplex Bldg. (3) ops eq't'd 4<sup>th</sup> plmbd. Mixed pt base. 2010 Gross Collect \$250K on 3 day wk. 2,150 sq ft bldg. **REDUCED**

**GLENDALE #6** - (5) op state of the art comput. G.P. 4 ops eq't'd, 5<sup>th</sup> op plumbed. Digital x-ray & networked. Mixed pt base. In a free stand bldg.. Annual Gross Collect.~\$500K. **NEW**

**NEWPORT BEACH** - (5) op comput. G.P. 4 ops eq't'd/5<sup>th</sup> plmbd. In a prof. bldg. on the Marina. Cash/Ins/PPO small % cap. Dentrux & Shick. Collects \$400K+ on a (2) day wk. **NEW**

**NORTHRIDGE** - (4) op compt. G.P. Mixed pt. base. 2010 Gross Collect. ~\$400K. **SOLD**

**No. COUNTY SAN DIEGO** - (4) op comput G.P. in a shop ctr. w excell exposure & signage. Cash/Ins/PPO/HMO pts. Dentrux s/w, paperless & digital. Gross Collections \$900K+/yr. **NEW**

**OXNARD #5 BLDG. & PRACTICE** - (4) op comput G.P. in a free stand bldg. w a pole sign. On a very busy main road. Mixed pt base. 2011 Project Gross Collect \$447K. **NEW**

**RESEDA #6** - (3) op comput G.P. located in a well know, easily accessible prof. bldg. Cash/Ins/PPO pts. Annual Gross Collections ~\$150K on a p.t. schedule.

**SANTA BARBARA #2/GOLETA** - (4) op computerized G.P. located in a garden style prof. bldg. w St. frontage. (3) ops eq't'd/4<sup>th</sup> plumbed. Cash/Ins/PPO pt. base. (4) days of hygiene/wk., approx. (20) new pts/mos. Pano eq't'd. Collects. \$400K+/yr. on a (4) day wk. **NEW**

**SANTA BARBARA #3** - (3) op comput. G.P. in a prof/med/dental bldg. Cash/Ins/PPO. 8-10 new pts/mos Gross Collect. \$250K+ on a (4) day wk. Digital x-ray. Seller retiring. **NEW**

**UPLAND #3** - (5) op comput G.P. & Speciality Pract. in a free stand bldg. Gross Collect \$525K-\$625K/yr. Digital x-ray. Excell opp. for G.P. who likes to do Endo. **BACK on MARKET**

**WEST HILLS** - (3) op compt G.P. in a prof. bldg. Newer leaseholds. Cash/Ins/PPO. Digital x-rays & Dentrux s/w. 2010 Gross Collect. ~\$305K part time. Seller retiring. **BACK on MARKET**

**WESTLAKE VILLAGE #2** - (4) op compt. G.P. (3) eq't'd. Gross Collections ~\$629K. **SOLD**

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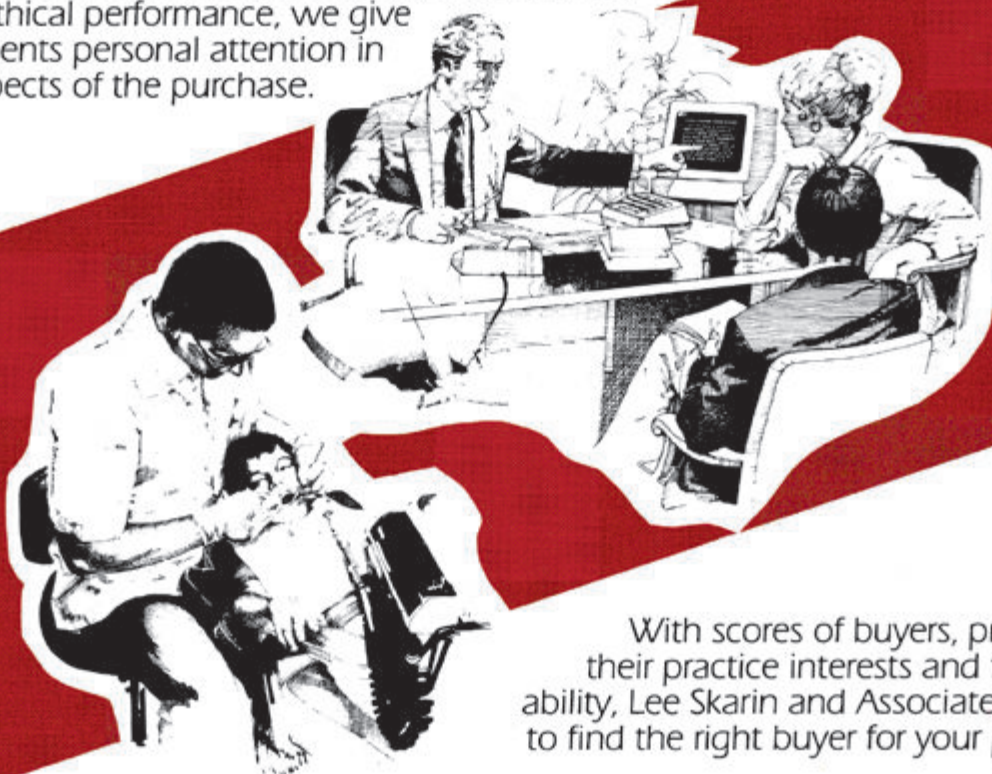
**COASTAL EUREKA PRACTICE FOR SALE OR LEASE —** Family practice in beautiful semi-rural area with fantastic outdoor recreation. Production/collection average 80,000/month with high net, a FFS practice with no capitation and doctor only working 14 days/month. Large loyal patient base would support two dentists. Great growth potential by adding endo, perio, and oral surgery and increasing work schedule. Priced at \$625K. Building available for favorable lease or purchase. Owner considering adding associate dentist while transitioning to retirement. Call after 6pm Pacific Time 707-499-9799.

**PEDIATRIC PRACTICE IN EUREKA, CALIFORNIA —** Don't miss this opportunity! Perfect situation for one or two pediatric dentists looking for an exceptional life style, higher than average income/benefits working in a state-of-the-art facility with six bays, one quiet room and lots of extras! Revenues of \$1.5M with low overhead and limited competition. Owner retiring and motivated. Check it out! Email growingsmilesdds@sbcglobal.net.



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DR. BOB, CONTINUED FROM 766

your sweet patootie du jour before a flinty librarian pointedly told you to pipe down or get out. Life was simpler.

The point is, it was a nearly forgotten, but simpler dental era as well, characterized by relatively few treatment modalities or options and, fewer still, required information or instructions beyond, “Open wide” and “Hold still.”

If we said something was needed and this was the way we were going to handle it, then, by the authority vested in us under the laws of the State of California, that was it. Now, of course, that is *not* it.

Informed Consent and Second Opinion are the twin progenitors of the present state of lengthy dental procedures not involving burs and impression materials. Fortunately, most dentists love to talk. Even though we don’t get paid for it as lawyers or talk-show hosts do, there is a certain satisfaction in dominating the conversation without interruption, even though it involves immersing both hands in somebody’s mouth.

There are three reasons for acquiring information: some people want to know it, some want to use it, but most want to disseminate it, or think they have to. No sooner does a newly minted dentist get a captive fee-paying audience, than the eight years of accumulated dental lore bursts forth like a breached Mississippi levee. This is not necessarily a bad thing, especially now that legal disclosures are firmly in place.

Dentistry can be a hard sell. People resent maverick body parts like eyes, ears, teeth and waistlines that have elected to go rogue. Traditionally, this begins about 40, but there are distressing signs, judging from MTV, that 27 is the new 40. There is no extended warranty beyond birth. A \$1,000 root canal treatment is not destined to compete with any other product or service. Gum surgery appeals only to masochists. Salesmen for cemetery plots have an easier pitch.

Thanks to the blanketing effect of advertising in this age of an omnipresent media, patients are well aware of all their new entitlements such as the Perfect Smile, One-Hour Implants and the mollifying effect of lasers. Nevertheless, patients are still pretty much of one mind, i.e., get in, get it over and get out. We are not their bosom buddies, our offices are not a Starbucks in which to hang out, plugged into their Wi-Fi. If the new dentist hasn’t already learned this in school, his patients will soon make it clear.

“How does that feel when you close?” he asks tentatively.

“Just fine,” mumbles the reluctant recipient of our accumulated expertise. “Fine, fine, feels just fine,” he bleats, right leg already over the edge of the chair, both hands trying to debib himself to hasten the exodus.

Not so fast there, dear patient!

As Jefferson once noted, “It is the trade of lawyers to question everything, yield nothing and to talk by the hour.” The two aforementioned legal concepts have forced even normally mute or taciturn dentists to babble on like a filibustering senator.

Take a relatively simple requirement of restoring a molar with at least three surfaces involved. Obviously, the patient cannot give his informed consent until we’ve outlined every available option known to present-day dentistry, including the nature of the restorative materials, their cost, durability and chances of taking 10 years off his or her age. A conscientious dentist can spend the best part of a work day just getting through the basics and that precludes the patient asking questions. The Q & A session could easily add another hour of interrogation during which he might ask for the key to the restroom and never return. This is an unacceptable risk.

Checking the patient’s eyeballs for evidence of TMI glazing is as important as checking his other vitals. He has to be sufficiently conscious to sign the

Informed Consent form and to initial the take-home brochure that repeats everything we have said, plus adds all the downsides to every option.

Our groggy patient, visibly bleeding from both ears and staggering under the information overload, might in his weakened state, plead, “You’re the doctor — do whatever you think is right.”

Flattering, but time to recommend The Second Opinion Option. The next estimate could offer essentially the same information, in which case the patient may elect to favor the office featuring the most endearing assistants or best selection of current magazines. Should the second opinion result in a monetary differential equal to the first year’s payments on a Mercedes Maybach, he might then be forced to entertain an entirely new set of recommendations that now indicate a third, or even a fourth consult if he is to be really, really informed. One doesn’t give one’s consent lightly.

We know few dentists who are paid to just consult without producing something more tangible than words, although this may be a future specialty in dentistry. We know even fewer patients who willing pay for information when unaccompanied by the traditional laying on of hands.

“I had a dental appointment today.”

“What’d you have done?”

“Nothing. Like Desi, he had a lot of ‘splaining to do. I have a menu with estimates of 75 choices and their pros and cons.”

“So ...?”

“I’m going for a second opinion.”

A concept like “billable hours” is not commonly encountered in dental offices. Why not? We need to find out how lawyers manage this. If it weren’t for the palpable uneasiness of having a lawyer for a patient, we might learn if billable hours based on verbal content alone could work for us while \$50,000 worth of dental equipment sits idling in the background.

We might get a second opinion. ■■■■

# The Information Age



Gum surgery appeals  
only to masochists.  
Salesmen for cemetery  
plots have an easier pitch.

➔ Robert E.  
Horseman,  
DDS

ILLUSTRATION  
BY DAN HUBIG

This is for all you youngsters out there under the age of 60 who feign interest when a veteran of the earlier years of dentistry pinions you in the corner with bewitching accounts of how it was in “the old days.”

Remember, this was before Google, Wikipedia, Twittter and Facebook. Sure, we had the wheel and fire had been invented, but our main sources of information prior to Al Gore were the public library and *The World Book*. Every year after 1917, like Girl Scouts mounting a major cookie campaign, *The World Book* salesmen would infiltrate neighborhoods a few weeks before school started in September and try to con parents into buying this magnificent set of encyclopedias. Your kid’s chances of matriculating high school without this valuable aid were almost nil, they claimed.

By carefully rearranging the sentences on any of the *The World Book* pages relevant to homework assignments, at least a “C” was a shoo-in. If you signed right now, it was quite possible the whole set would be paid for by the time the child was 25 or graduated college, whichever came first.

Fortunately, if this happened during the Great Depression years, your folks couldn’t afford the beautifully bound set of books, freeing you to join the other kids at the public library where you wanted to be in the first place.

The library was like Starbucks without coffee and Wi-Fi. It was a superior source of information of all kinds, some of it scholarly. You could mingle for hours in this coeducational venue ostensibly engaged in serious research while exchanging primitive versions of Tweets with

CONTINUES ON 765

# *When you want your practice sales **DONE RIGHT.***

*Dr. Robin's upcoming speaking engagements.  
Call us for more details.*

- *September 22nd, 2011* - California Dental Association, San Francisco session; *Dental Practice Act.*
- *October 6th, 2011* - Orthodontic Study Club, Diamond Bar; *Dental Practice Act.*
- *October 16th, 2011* - La Vie En Rose, Brea; *Dental Practice Act.*
- *November 3rd, 2011* - Lucianas, Dana Point; *Practice Sales & Transitions.*
- *January 19th, 2012* - Southern California Oral/Facial Study Club, Tarzana; *Dental Practice Act.*
- *March 4th, 2012* - Loma Linda University, Loma Linda; *Dental Practice Act.*
- *May 3rd, 2012* - California Dental Association, Anaheim session; *Dental Practice Act.*



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