OF THE CALIFORNIA DENTAL ASSOCIATION

Journal

JUNE 2013

Management of Antithrombotic Therapy

CAD/CAM Technology for Complete Dentures

Risk Factors Affecting the Severity of Meth Mouth

Sat FLUORIDATION



You are also not a sales goal or a benchmark or a market segment. You are a dentist. And we are The Dentists Insurance Company, TDIC. More than 30 years ago, the small group of CDA dentists who started this company made three promises: to only protect dentists, to protect them better than any other insurance company out there and to be there when you need us. Because with TDIC, you're a dentist first, last and always.

Protecting dentists. It's all we do.[®] 800.733.0633 | tdicsolutions.com | CA Insurance Lic. #0652783

June 13

DEPARTMENTS

377 The Editor/Back on the Same Page ... Maybe Not

381 Impressions

- 389 CDA Presents
- 431 Tech Trends
- 433 Continuing Education
- **445** Classifieds
- **456** Advertiser Index
- **458** Dr. Bob/Is Anyone Out There?



FEATURES

394 SALT FLUORIDATION: A REVIEW

This paper reviews the evidence of effectiveness in dental caries prevention and risks of dental fluorosis in countries where salt or milk fluoridation is practiced.

Howard F. Pollick, BDS, MPH

407 CAD/CAM COMPLETE DENTURES: A REVIEW OF TWO COMMERCIAL FABRICATION SYSTEMS

This article provides information on the technology available regarding a potential paradigm shift in the method of fabrication of complete dentures.

Mathew T. Kattadiyil, DDS, MDS, MS; Charles J. Goodacre, DDS, MSD, MS; and Nadim Z. Baba, DMD, MSD

417 MANAGEMENT OF ANTITHROMBOTIC THERAPY BEFORE FULL-MOUTH EXTRACTION

The management of antiplatelet and anticoagulant therapy before full-mouth extraction is a major concern for dentists. Specific recommendations are provided for antiplatelet therapy before full-mouth extraction.

R. Andrew Powless, DMD; Hesham R. Omar, MD; Devanand Mangar, MD; and Enrico M. Camporesi, MD

4 21 METH MOUTH SEVERITY IN RESPONSE TO DRUG-USE PATTERNS AND DENTAL ACCESS IN METHAMPHETAMINE USERS

This study questions whether drug-use patterns and dental care access are risk factors affecting the severity of meth mouth.

Ronni E. Brown, DDS, MPH; Donald E. Morisky, ScD, MSPH, ScM; and Steven J. Silverstein, DMD, MPH

429 SALT FLUORIDATION — AN ADJUNCT TO WATER FLUORIDATION

A letter about the benefits of salt fluoridation for areas of the country where water fluoridation is not feasible or is cost prohibitive.

Jack M. Saroyan, DDS

CDA Journal Volume 41, Number 6

cda.org/journal

Submitting a manuscript to the Journal? There's a site for that.



In fact, from letters to the editor to reviews, the new site is now the only way to submit anything to the Journal of the California Dental Association. Upload your content, receive automatic status updates, even track progress anytime day or night. See for yourself at www.editorialmanager.com/ jcaldentassoc





Journal of the California Dental Association

published by the California Dental Association 1201 K St., 14th Floor Sacramento, CA 95814 800.232.7645 cda.org

Management/Editorial

Kerry K. Carney, DDS, CDE EDITOR-IN-CHIEF Kerry.Carney@cda.org

Ruchi K. Sahota, DDS, CDE ASSOCIATE EDITOR

Brian K. Shue, DDS, CDE ASSOCIATE EDITOR

Peter A. DuBois EXECUTIVE DIRECTOR

Jennifer George CHIEF MARKETING OFFICER

Cathy Mudge VICE PRESIDENT, COMMUNITY AFFAIRS

Alicia Malaby COMMUNICATIONS DIRECTOR

Andrea LaMattina PUBLICATIONS SPECIALIST

Robert E. Horseman, DDS CONTRIBUTING EDITOR

Blake Ellington STAFF WRITER

Courtney Grant COMMUNICATIONS SPECIALIST

Jack F. Conley, DDS EDITOR EMERITUS

Stay Connected Visit cdg.org

Advertising Corey Gerhard ADVERTISING MANAGER

Jenaé Gruchow project/traffic administrator

Erin Jernigan ASSISTANT COORDINATOR

Production Val. B. Mina SENIOR GRAPHIC

DESIGNER Randi Taylor SENIOR GRAPHIC

DESIGNER

Ann Davis graphic designer/ production artist

California Dental

Lindsey A. Robinson, DDS PRESIDENT president@cda.org

James D. Stephens, DDS PRESIDENT-ELECT presidentelect@cda.org

Walter G. Weber, DDS VICE PRESIDENT vicepresident@cda.org

Kenneth G. Wallis, DDS SECRETARY secretary@cda.org

Clelan G. Ehrler, DDS TREASURER treasurer@cda.org

Alan L. Felsenfeld, DDS SPEAKER OF THE HOUSE speaker@cda.org

Daniel G. Davidson, DMD IMMEDIATE PAST PRESIDENT pastpresident@cda.org

Reader Guide:

Upcoming Topics JULY: Ethical Dilemmas AUGUST: Children's Care SEPTEMBER: Americans With Disabilities Act

Classified Advertising cda.org/classifieds

Display Advertising

Corey Gerhard ADVERTISING MANAGER Corey.Gerhard@cda.org 916.554.5304

Letters to the Editor www.editorialmanager.com/ jcaldentassoc

Permission and Reprints

Andrea LaMattina PUBLICATIONS SPECIALIST Andrea.LaMattina@cda.org 916.554.5950 Manuscript Submissions www.editorialmanager.com/ jcaldentassoc

Subscriptions

Subscriptions are available only to active members of the Association. The subscription rate is \$18 and is included in membership dues. Nonmembers can view the publication online at cda.org/journal.

Change of Address

Manage your subscription online: go to cda.org, log in and update any changes to your mailing information. Email questions or other changes to membership@ cda.org.

Journal of the California Dental Association (ISSN 1043-2256) is published monthly by the California Dental Association, 1201 K St., 16th Floor, Sacramento, CA 95814, 916-554-5950. Periodicals postage paid at Sacramento, Calif. Postmaster: Send address changes to Journal of the California Dental Association, P.O. Box 13749, Sacramento, CA 95853.

The Journal of the California Dental Association is published under the supervision of CDA's editorial staff. Neither the editorial staff, the editor, nor the association are responsible for any expression of opinion or statement of fact, all of which are published solely on the authority of the author whose name is indicated. The association reserves the right to illustrate, reduce, revise or reject any manuscript submitted. Articles are considered for publication on condition that they are contributed solely to the Journal.

Copyright 2013 by the California Dental Association.





Back on the Same Page ... Maybe Not

KERRY K. CARNEY, DDS, CDE

n 2009, there was a perturbation in the smooth orbits of dentistry and medicine around the central concept of prophylactic coverage of joint replacement patients undergoing dental treatment.

Ten years ago, the American Academy of Orthopaedic Surgeons (AAOS) and the American Dental Association (ADA) *jointly* published an advisory statement on the subject of prophylactic coverage of joint replacement patients. Their 2003 statement concluded that for patients with total joint replacements, "The risk/benefit and cost/effectiveness ratios fail to justify the administration of routine antibiotic prophylaxis."¹ Between 2003 and 2009 the medical and dental planets of thought harmoniously orbited the twin principles of "do no harm now" and "forestall future harm" from antibiotic resistant pathogens.

In 2009, the AAOS published an Information Statement entitled "Antibiotic Prophylaxis for Bacteremia in Patients With Joint Replacements," and like the gravitational disruption of a rogue planet, it caused the two organizations to wobble out of synchronicity and consensus.² Unlike the previous *joint* statement, the 2009 statement promoted more universal parameters for antibiotic prophylaxis. It advised, "Given the potential adverse outcomes and cost of treating an infected joint replacement, the AAOS recommends that clinicians consider antibiotic prophylaxis for all total joint replacement patients prior to any procedure that may cause bacteremia."2

Parties inside and outside the AAOS called for a rigorous, evidence-based, systematic review and clinical practice guideline to reconcile these conflicting recommendations. In 2010, the AAOS set out to do just that.

The AAOS Clinical Practice Guidelines



They almost always say, "What do you think, Doc?" I feel like a planet without an orbit.

process meets or exceeds all recommended Institute of Medicine (IOM) standards for the development of systematic reviews and clinical practice guidelines, save one; the IOM calls for patient input in the selection of topics and questions. The AAOS did not involve patient input.

The AAOS and ADA *joint* endeavor involved outreach for input from many interested parties: the Infectious Disease Society of America, American Association of Oral and Maxillofacial Surgeons, American Association of Neurological Surgeons, American Society of Plastic Surgeons, Musculoskeletal Infection Society, Scoliosis Research Society, American Association of Hip and Knee Surgeons, Society for Healthcare Epidemiology of America, College of American Pathologists and the Knee Society.³⁴

The systematic review of the literature resulted in three recommendations.³ These recommendations focused on three different issues with regard to patients with joint replacements who are undergoing dental procedures:

- prophylactic antibiotic coverage;
- the use of topical oral antimicrobials; and
- the importance of maintaining appropriate oral hygiene.

The exact wording of the final recommendations reflects the strength of available evidence based on a graded scale. The grades of evidence from strongest to weakest are "strong," "moderate," "limited," "inconclusive" and "consensus."

Systematic reviews must follow very strict criteria in evaluating evidence. Welldesigned, randomized, controlled trials are not common in the medical/dental literature. It is unusual for the reviews to find high-grade, "strong" evidence. The resulting Clinical Practice Guidelines consequently may rest on evidence evaluated as belonging along the weak end of the evidence scale.

The three recommendations in the 2012 guidelines are based on evidence graded as "limited," "inconclusive" and "consensus," respectively.

Recommendation 1: The practitioner might consider discontinuing the practice of routinely prescribing prophylactic antibiotics for patients with hip and knee prosthetic joint implants undergoing dental procedures.^{3.4}

The "limited" grade given to this recommendation rests on evidence that antibiotic prophylaxis reduces the incidence of post-dental procedure related bacteremia, but there is no evidence linking increased bacteremia to prosthetic joint infection. The existing studies rely on bacteremia as a surrogate measure.

The "limited" grade means that "practitioners should be cautious in deciding whether to follow [the] recommendation ... and should exercise judgment and be alert to emerging publications that report evidence. Patient preference should have a substantial influencing role."³⁴ Recommendation 2: We are unable to recommend for or against the use of topical oral antimicrobials in patients with prosthetic joint implants or other orthopaedic implants undergoing dental procedures.^{3,4}

This recommendation is graded "inconclusive." "Practitioners should feel little constraint in deciding whether to follow [this] recommendation ... and should exercise judgment and be alert to future publications that clarify existing evidence for determining balance of benefits versus potential harm. Patient preference should have a substantial influencing role."^{3.4}

Recommendation 3: In the absence of reliable evidence linking poor oral health to prosthetic joint infection, it is the opinion of the work group that patients with prosthetic joint implants or other orthopaedic implants maintain appropriate oral hygiene.^{3.4}

This recommendation was graded "consensus." Therefore, "[p]ractitioners should be flexible in deciding whether to follow a recommendation classified as 'consensus' although they may set boundaries on alternatives. Patient preference should have a substantial influencing role."³⁴

The first recommendation is the one that interests most of us. It addresses the conflicting recommendations about antibiotics or no antibiotics before dental procedures for joint surgery patients. Here is the question the practitioner wants answered: Is it prudent and safe to forego antibiotic prophylaxis for the joint implant patient?

The guidance in the first recommendation advises the practitioner to be cautious, "exercise judgment and be alert to emerging publications that report evidence ..." about whether to discontinue routine prophylactic antibiotics. This recommendation does not make me feel much wiser and does not help during a discussion with the patient's orthopaedic surgeon about our mutual patient's present and future health.

Archibald Cochrane, the father of evidence-based medicine, questioned the effectiveness of commonly accepted therapeutic practices. He proposed that routine medical practices should pass scientific testing of their effectiveness or benefit. Without strong evidence to support the effectiveness of a therapeutic practice, Cochrane questioned whether it should continue to be implemented. He had witnessed the amazing unaided recuperative abilities of the human body during his experience as the only physician in a prisoner of war camp with thousands of fellow prisoners. We now associate Cochrane with evidence-based medicine, but we have lost sight of his basic belief that unless an intervention can be demonstrated to be effective, it should not be the preferred treatment.

The recommendations seem to have gotten bogged down in surrogate measures due to the lack of cause-andeffect demonstrability. All three of the recommendations include the advice that "patient preference should have a substantial influencing role."

So I try to give a complete description of the problem, the evidence and the opinions to my joint replacement patients. I give them copies of relevant articles to help them decide. I give them time to read and consider their situation and later ask them whether they prefer to take an antibiotic prophylaxis before dental procedures or not. They almost always say, "What do you think, Doc?"

I feel like a planet without an orbit.

Without strong evidence to prove that prophylactic antibiotic coverage is effective in preventing infection, and with evidence that over-use of antibiotics is contributing to the emergence of resistant bacterial strains, a patient might be better served by foregoing prophylactic antibiotic coverage. However, my colleagues in medicine might believe otherwise. It seems like a lot of time, effort and money was spent on the 2012 review and recommendations and my patients and I are still in the same quandary. The whole exercise makes me feel a little out of *joint*.

REFERENCES

 Advisory Statement: Antibiotic prophylaxis for dental patients with total joint replacement. J Am Dent Assoc 2003; 134(7):895-898.

2. Antibiotic Prophylaxis for Bacteremia in Patients with Joint Replacements Doc No. 1033 (Retired December 2012 and replaced by Guideline on Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures) www. aaos.org/research/guidelines/PUDP/dental_guideline.asp. 3. Rethman M, et al. Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures Executive Summary on the AAOS/ADA Clinical Practice Guideline. Accessed from ada.org/sections/professionalResources/ pdfs/dentalexecsumm.pdf.

4. www.aaos.org/research/guidelines/PUDP/dental_guideline.asp.

The Journal of the California Dental Association welcomes letters.

We reserve the right to edit all communications and require that all letters be signed. Letters should discuss an item published in the Journal within the past two months or matters of general interest to our readership. Letters must be no more than 500 words and cite no more than five references. No illustrations will be accepted. Letters may be submitted at editorialmanager.com/ jcaldentassoc. By sending the letter to the Journal. the author certifies that neither the letter nor one with substantially similar content under the writer's authorship has been published or is being considered for publication elsewhere, and the author acknowledges and agrees that the letter and all rights of the author with regard to the letter become the property of the California Dental Association.

The Use of Interim Therapeutic Restorations in the Virtual Dental Home System

rs. Holmgren and Frencken have raised some excellent points in their letter to the Journal (J Calif Dent Assoc, May 2013:41(5):307-8). Their letter was very supportive of the approach we are taking in expanding the ability of the dental profession to reach underserved communities and populations who do not take advantage of the traditional dental care system. As they point out, we have created a model where dentists working in traditional office-based clinics and practices can work with allied dental personnel in geographically separated telehealth connected teams. Through an emphasis on early diagnosis, prevention and therapeutic interventions, many people in these groups can be kept healthy who would have otherwise developed advanced dental disease and experienced the many consequences of neglected dental diseases.

Drs. Holmgren and Frencken's stated purpose in writing their letter is to point out the fact that the technique referred to the in the multiple articles in the July 2012 issue of the *Journal* is called an "interim therapeutic restoration" (ITR) and that there is a long-standing and extensive worldwide literature referring to the same or similar techniques as the "atraumatic restorative technique" (ART). We are well aware of this literature and it is cited primarily and secondarily in the articles in the July 2012 issue of the *Journal*.

We chose the term interim therapeutic restoration to describe the procedure used in the virtual dental home system because it is the term adopted by the American Association of Pediatric Dentistry.¹ Drs. Holmgren and Frencken seem to object to the term "interim" and they point out to the evidence for longevity of ART restorations. We do not disagree with this viewpoint, but we do believe in recognizing the options for a dentist to evaluate the tooth and the restoration on an ongoing basis and make further treatment decisions based on that evaluation.

In the worldwide literature and in the AAPD Policy Statement there are a range of techniques described. The technique we are using is within that range but specifically involves the removal of soft material from the cavity using hand instruments while avoiding material on the pulpal floor of the cavity in all but shallow restorations. The technique described by Drs. Holmgren and Frencken is more aggressive and involves removal of "infected dentine," and preservation of "affected dentine." However, there is a growing body of evidence that "partial caries removal" involving placing glass ionomer restorative material over frank carious tooth structure stops the progression of the caries process and reduces the incidence of pulpal symptoms and pulpal exposure.^{2,3} In the virtual dental home system, the ITR is completed by allied dental personnel after a dentist has made the determination and provided instructions to do so. Ratings by two evaluating dentists of each of the more than 400 restorations placed to date indicate that all restorations have been "acceptable" according to the evaluation criteria we are using and that there have been no adverse consequences from any of the procedures performed by allied dental personnel in this system.



We want to again thank Drs. Holmgren and Frencken for raising awareness about the long history of this type of restoration. We appreciate their support in recognizing that the use of the ITR contributes to the ability of the virtual dental home system to reach and improve the oral health of many underserved and vulnerable people.

PAUL GLASSMAN, DDS, MA, MBA PROFESSOR OF DENTAL PRACTICE AND DIRECTOR OF COMMUNITY ORAL HEALTH DIRECTOR OF THE PACIFIC CENTER FOR SPECIAL CARE ARTHUR A. DUGONI SCHOOL OF DENTISTRY San Francisco, Calif.

REFERENCES

 American Academy of Pediatric Dentistry Council on Clinical Affairs Oral Health Policies Reference Manual, Policy on Interim Therapeutic Restorations (ITR). Pages 48-9, 2008.
 Mertz-Fairhurst EJ, et al. Ultraconservative and Cariostatic Sealed Restorations: Results at Year 10. J Am Dent Assoc 1998:129:55-66.

3. Schwendicke F, Dorfer CE, Paris S. Incomplete Caries Removal: A Systematic Review and Meta-analysis. *J Dent* Res 2013: 92(4):306-314.



Dare to Compare on Innovation, **Quality, Service and Value**

Legacy[™]3 Implant

All-in-1 Packaging includes implant, abutment, transfer, cover screw & healing collar \$200 vs \$633¹ from Zimmer Dental







All-in-1 Packaging includes implant, straight abutment/transfer, cover screw & healing collar \$200 vs \$737² from Straumann[®]

Reality Check Straumann Customers

Save \$537 with SwishPlant

ReActive™ Implant

All-in-1 Packaging includes implant, abutment, transfer & cover screw \$200 vs \$718³ from Nobel Biocare™







Implant Direct's New Las Vegas Training Center

Implant Direct offers an extensive list of educational opportunities at its Las Vegas Training Center with computers at each desk for Image Guided Surgical Training, models/mannequins for hands-on training and a four chair dental office for live surgical demonstrations.



Implant Dentistry 101: Three-Day Introductory Course June 13-15 | July 18-20 | September 12-14



3D Implantology: Two-Day Advanced Course Featuring Anatomage Passage surgical guide starter software August 16-17 | October 18-19



View Dr. Niznick's 2-Hour Lecture at Las Vegas Training Center & Earn 2 CE Credits FREE

innovations are shaping the future of implantology.

Dr. Gerald Niznick discusses how the latest implant design



New Check out our easy to use mobile app!

Introductory Offer: Make the switch & receive three FREE implants.⁴

Price comparisons based upon US list prices as of January 2013. All trademarks are property of their respective companies. Satisfied among Current and Former Users, by Company US Q211 Millenium Research Group A Decision Research, Inc. Company 'US list price for Tapered Screw-Vent with micro grooves, healing collar & straight abutment 'US list price for SLActive Tapered Effect Implant, closure screw, healing abutment, solid abutment, ransfer and comfort cap. 'US list price for NobelActive with cover screw, impression coping & abutment 4Terms and conditions apply

Live surgical demonstrations not available at all courses

www.implantdirect.com | 888-649-6425



Approved PACE Program Provider FAGD/MAGD Credit Approval does not imply acceptance by a state or provincial board of dentistry or AGD endorsement . 8/1/2012 to 7/31/2015 Provider ID# 316714

Impressions



Disclosure

BY DAVID W. CHAMBERS, PHD

The joke 150 years ago was that God never let the sun set on the British Empire because he didn't trust the Brits with the lights out. That is a version of the ethical chestnut "Don't do anything you would find awkward to have to explain."

This is a catchy ethical standard; good stuff for editorials. It is standard form to disclose conflicts of interest for C.E. speakers and authors of journal articles plumping new products and procedures. The FDA requires full warnings for therapeutic claims (but not for cosmetic ones). If Enron had only been transparent in reporting its financial dealings, American business would not be plagued with Sarbanes-Oxley reporting regulations. Sunshine is a good disinfectant. Disclosure is better. But neither should be used universally.

CONTINUES ON 383

Aspirin to Help Fight Head and Neck Cancer

Although evidence for nonsteroidal anti-inflammatory drugs (NSAIDs) preventing head and neck cancer is inconclusive, a new study aimed to determine if an association exists between aspirin and reduced risk of head and neck cancer.

For this study, published in the *British Journal of Cancer*, the researchers used data from the United States National Cancer Institute Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial, and examined the association between aspirin and ibuprofen use and head and neck cancer.

The team of U.K. researchers, from Queen's University Belfast and the National Cancer Institute, found that regular aspirin use was associated with a significant 22 percent

reduction in head and neck cancer risk, the study noted. However, no association was observed with regular ibuprofen use.

Aspirin may have potential as a chemo-preventive agent for head and neck cancer, the authors wrote, but further investigation is warranted.

For more information, see the study "Nonsteroidal anti-inflammatory drug and aspirin use and the risk of head and neck cancer" in the *British Journal* of Cancer (2013) vol. 108:5, pp. 1178-1181.





Study Provides Guidance on Delivering Bad News to Patients

In a new study, authors reviewed issues relating to delivering bad medical news to dental patients and offered suggestions for "appropriately and sensitively delivering bad medical news to both patients and their families in a supportive fashion."

According to the study, published in the *Journal of the American Dental Association*, because dental care providers may diagnose diseases and conditions that affect a patient's general health, authors believe "dental care providers should be familiar with the oral manifestations of diseases and the care needed before the patient undergoes medical treatment and use effective communication necessary to share bad news with patients."

Authors provided a guide to help deliver difficult information referred to as the ABCDE model, which involves Advance preparation, Building a therapeutic relationship or environment, Communicating well, Dealing with patient and family reactions and Encouraging and validating emotions.

With regard to the impact on the dentist, authors said those who "detect a suspicious oral mucosal lesion or symptoms that are highly suggestive of a malignant or serious disease and have basic knowledge regarding potential treatment, common complications and the prognosis of the disease inevitably experience both psychological and physical stress."

The authors suggest that for the well-being of both practitioners and patients, "empathetic and effective delivery of bad medical news should be included in dental school curricula and continuing education courses."

For more information, see the study in the *Journal of the American Dental Association*, April 1, 2013, vol. 144, no. 4, pp. 381-386.

Dental Scaling in Lowering Risk of Cardiovascular Events

Improvement of oral hygiene by dental scaling may be associated with a decreased risk of cardiovascular events, according to a new study in the *International Journal of Cardiology*. According to authors, the goal of the study was to investigate whether dental scaling can reduce the risk of atrial fibrillation.

With a total of 28,909 subjects who were age 60 or older without past history of cardiac arrhythmias identified from the "National Health Insurance Research Database" in Taiwan, researchers selected those subjects who had received dental scaling at least once a year for three consecutive years (1998–2000) to be the exposed group. The nonexposed group consisted of 13,564 age, sex and underlying disease-matched subjects who did not receive dental scaling.

In a follow-up of 4.6±1.1 years, researchers found the exposed group had a lower AF occurrence rate than the nonexposed group.

"The risk of AF was lower in subjects receiving dental scaling," authors wrote, concluding that "improvement of oral hygiene by dental scaling may be a simple and useful way to prevent AF."

For more information, see the study published online March 1, 2013, in the International Journal of Cardiology.

Surgeon General Endorses Fluoridation

U.S. Surgeon General Regina Benjamin, MD, has officially endorsed community water fluoridation as "one of the most effective choices communities can make to prevent health problems while actually improving the oral health of their citizens."

Benjamin made her public endorsement in a letter read at the opening ceremony at the National Oral Health Conference in Huntsville, Ala., in April.

"Fluoridation's effectiveness in preventing tooth decay is not limited to children, but extends throughout life, resulting in fewer and less severe cavities," Benjamin wrote. "In fact, each generation born since the implementation of water fluoridation has enjoyed better dental health than the generation that preceded it."

CDA has a long history of supporting community water fluoridation and will continue its efforts to ensure more communities across California reach optimal levels of fluoride in their water supplies.

"We are very pleased with Dr. Benjamin's public endorsement of fluoridation," said CDA President Lindsey Robinson, DDS. "And it is important that we remain committed to this great public health achievement so more communities — especially our children — can receive its benefits."

The Surgeon General's letter to the National Oral Health Conference is available on ADA.org. For more information, visit ada.org/news/8532.aspx.



DISCLOSURE, CONTINUED FROM 381

There are two problems with the "Don't do it if you wouldn't feel free to talk about it in public" rule. First, there is that little word "if." Moral scofflaws solve the disclosure problem by simply imagining that they will never have to provide a public account of their behavior. The odds of being caught and forced to confess are so slim. Politicians and business leaders have shown what to do if accused. Like Bernie Madoff and Bill Clinton, they simply say, "I did nothing wrong." No shame: no guilt. Research has shown that Sarbanes-Oxley has had no impact.

Secondly, transparency sometimes conflicts with privacy. That is why there are locks on the doors of public bathrooms. HIPAA regulations equate nontransparency with professionalism in some cases. Trade secrets, labor bargaining or contract negotiations are not expected to be revealed in ethical conversations. The confessional in the Roman Catholic religion and patient disclosure of full health histories would collapse if made public.

There is in fact a serious academic school of moral philosophy based on disclosure. Adam Smith, the Scottish thinker at the time of the American Revolution who wrote The Wealth of Nations, advocated for an ethics of moral sentiment. A key element in his system was the "impartial spectator." The moral test, for Smith, was to ask, "What would an observer who was completely knowledgeable of every detail of the situation, unerringly rational and perfectly impartial do?" The ethical individual is supposed to reflect from this perspective and choose as the impartial spectator would choose.

Smith is not so popular anymore. It's so hard to find impartial spectators. We — having limits on our knowledge, rationality and partiality — have difficulty recognizing what the impartial spectator would do. The default position seems to be, "Could I defend what I want to do if I absolutely had to?" That is hardly a firm foundation for moral behavior.

The nub:

• There is no impartial spectator; we are being silly when we sign up for that job.

It is acceptable not to disclose information relevant to moral choices, provided that one can disclose the reasons for failing to disclose.

The only person to whom 100 percent disclosure of factors in moral choice is owed is ourselves.

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.

Administering local anesthesia is easy.



It's the ins-and-outs of hiring that's truly mind numbing.

Thankfully, there's CDA's Compass. This handy website is where you can listen to podcasts on how to write job descriptions and conduct interviews. Plus, there are useful checklists to ensure your hiring process is by the book. There's even a pre-employment application. CDA's Compass. Everything you need to make the business side of dentistry absolutely painless.



cdacompass.com where smart dentists get smarter."



Smoking Shortly After Waking May Up Cancer Risk

Smoking immediately upon waking may increase the risk of lung and oral cancer, according to Penn State researchers.

"We found that smokers who consume cigarettes immediately after waking have higher levels of NNAL — a metabolite of the tobacco-specific carcinogen NNK — in their blood than smokers who refrain from smoking a half hour or more after waking, regardless of how many cigarettes they smoke per day," said Steven Branstetter, assistant professor of biobehavioral health, in a Penn State news release.

Authors of the study, published in the journal *Cancer, Epidemiology, Biomarkers and Prevention*, examined data on 1,945 smoking adult participants from the National Health and Nutrition Examination Survey who had provided urine samples for analysis of NNAL. These participants also had provided information about their smoking behavior, including how soon they typically smoked after waking.

According to the news release, researchers found that roughly 32 percent of the participants examined smoked their first cigarette of the day within five minutes of waking; 31 percent smoked within six to 30 minutes of waking; 18 percent smoked within 31 to 60 minutes of waking; and 19 percent smoked more than one hour after waking.

"The cigarette-per-day adjusted levels of NNAL were twice as high in participants who smoked within five minutes after waking than in participants who refrained from smoking for at least one hour," authors wrote.

For more information, see the study in the journal *Cancer, Epidemiology, Biomarkers and Prevention*, vol. 22, no. 4, pp. 615-622.

Resin Infiltration Technique Offers 'Feasible Alternative' for Fluorosis and Hypoplasia Stains

A new clinical report, published in the *Journal of Esthetic and Restorative Dentistry*, found that using the minimally invasive "infiltrant resin technique" to treat teeth with mild-to-moderate enamel fluorosis "may allow significant improvement in the appearance and color uniformity of teeth in a relatively short working time."

The technique, which aims to prevent enamel lesions from further demineralization and provide a highly conservative therapy, utilizes light-polymerized resin composites optimized for rapid infiltration of enamel lesions with resin light curing monomers, the authors wrote.

According to the study, this technique, which has proved to be an effective treatment for blending white spot lesions because the microporosities of infiltrated lesions are filled with resin, "may be considered a feasible alternative without the need for abrasion and mechanical tooth preparation."

The study showed that the resin infiltration technique has potential to be considered as a minimally invasive procedure for mild-to-moderate fluorosis and hypoplasia stains, authors wrote, noting that "although the results of this case report are encouraging, further evaluation of this technique for different types of lesions and in a larger sample size of patients is required."

For more information, see the study in the *Journal of Esthetic and Restorative Dentistry*, vol. 25, no. 1, pp. 32–39.



Inferior Alveolar Nerve Blocks and Third-Molar Development in Children

In a recent study, researchers evaluated the possible association between inferior alveolar nerve blocks (IANBs) and missing third molars in children. While further research is needed to verify results, authors found in this study that third-molar development may be stopped in young children who received IANBs when the third-molar tooth bud was immature.

Published in the *Journal of the American Dental Association*, the study used 439 potential sites of third-molar development for evidence of third-molar follicles on panoramic radiographs of randomly selected children 7 years and older, authors wrote.

Comparing the incidence of missing third-molar follicles in a control group of children who had no history of receiving IANBs with children in a test group who had a definitive history of receiving IANBs, authors found



a statistically significant greater incidence of missing third-molar follicles in mandibular quadrants that had received that IANBs.

Cautioning that further research is still needed, the authors found "dentists inadvertently may be stopping the development of third molars when administering IANBs to children."

For more information, see the study in the *Journal of the* American Dental Association, April 1, 2013, vol. 144, no. 4, pp. 389-395.

TMJ Disc Perforation and Operative Arthroscopy

Disc perforation (DP) is one of the most important pathologic signs of intracapsular temporomandibular joint (TMJ) disease, and with few clinical studies focusing on the arthroscopic management of this feature, researchers in Spain recently set out to assess whether operative arthroscopy with abrasion of the perforation borders is effective for the treatment of this alteration of the internal derangement of the TMJ, according to a study in the Journal of Oral and Maxillofacial Surgery.

Using 36 patients (39 joints) who underwent TMJ arthroscopy under general anesthesia and presented with DP (classified into three groups according to size: small, medium or large), researchers assessed pain, maximal interincisal opening, and lateral and protrusive excursions at months 1, 3, 6, 12, 24 and 48 after surgery. "In the global group, the mean score of preoperative pain according to the visual analog scale was 53.97 mm, which decreased to 14.33 mm at 4-year follow-up," authors wrote. According to the researchers, a statistically significant increase in mouth opening was observed in the global group from six months postoperatively, but no significant differences were observed in the medium and large groups from before surgery to the different times of follow-up.

"Operative arthroscopy of the TMJ is a reliable and effective procedure for the articular dysfunction associated with DP because this procedure alleviates pain and improves mouth opening," authors concluded, noting that patients with small perforations are better candidates for this surgical treatment.

For more information, see the study published in the *Journal of Oral and Maxillofacial Surgery*, vol. 71, issue 4, pp. 667-676.



New Study Reports Dental Bib Clips May Harbor Bacteria Even After Disinfection

A recent study focusing on dental bib clips and the presence of bacteria may have patients asking questions in your dental practice. The new study, by researchers at Tufts University School of Dental Medicine and the Forsyth Institute, reported that a significant proportion of dental bib clips harbored bacteria from the patient, dental clinician and the environment even after the clips had undergone standard disinfection procedures in a hygiene clinic, according to news release from Forsyth Institute.

Researchers investigated the aerobic and anaerobic bacterial contaminant loads on the surfaces of the clips immediately after hygiene treatments were rendered and again after the bib clips were disinfected.

Although the majority of the thousands of bacteria found on the bib clips immediately after treatment were adequately eliminated through the disinfection procedure, the researchers found that 40 percent of the bib clips tested post-disinfection retained one or more aerobic bacteria, which can survive and grow in oxygenated environments.



They found that 70 percent of bib clips tested post-disinfection retained one or more anaerobic bacteria, which do not live or grow in the presence of oxygen.

"While the disinfection procedure is significantly effective, 40 percent and 70 percent of the tested clips still harbored one or more aerobic and anaerobic bacteria, respectively," authors concluded, noting that "none of these bacteria was considered to be periodontal pathogens."

For more information, see the full study titled "Comprehensive Analysis of Aerobic and Anaerobic Bacteria Found on Dental Bib Clips at Hygiene Clinic" published as a supplement to the April 2013 issue of Compendium of Continuing Education in Dentistry, or see the news release at forsyth.org/news/stories/82.

UPCOMING	MEETINGS
2013	
July 18–20	ADA 27th New Dentist Conference, Denver, 312-440-3524 or newdentist@ada.org
Aug. 15-17	CDA Presents The Art and Science of Dentistry, San Francisco, 800-CDA-SMILE (232-7645) or cdapresents.com
Oct. 31– Nov. 5	154th ADA Annual Session, New Orleans, ada.org/session
Nov. 3-9	U.S. Dental Tennis Association, Big Island, Hawaii, 800-445-2524 or dentaltennis.org
Nov. 10–13	National Primary Oral Health Conference, Denver, nnoha.org/conference/ npohc.html

To have an event included on this list of nonprofit association continuing education meetings, please email Courtney Grant at courtney.grant@cda.org.



The Art and Science of Dentistry

Save the dates!

Moscone South San Francisco

Thursday – Saturday August 15–17, 2013

cdapresents.com



So many ways to be



CDA Presents The Art and Science of Dentistry is where thousands of your peers hone their craft. It's three days packed with worldrenowned speakers, networking opportunities and even a little fun.



The beautiful new Exploratorium at Pier 15 on San Francisco's Embarcadero is the setting for this year's CDA Party. Join us for mouth-watering delicasies, fascinating exhibits and live music.



inspired. C





Save big on the exhibit floor and get a sneak peek at a multitude of new products.



- Gain insight on the ins-and-outs of dental benefit plans as well as critical social media dos-and-don'ts.
- Guarantee your spot in popular lectures with reserved seating.

To register, or for more information including hotel specials, visit cdapresents.com

> This new app makes the show a snap. Search courses, find exhibitors, link to the C.E. website and download course handouts.

The Art and Science of Dentistry

San Francisco, California Thursday-Saturday August 15-17, 2013



New International Symposia feature four lectures with Japanese Drs. Minami and Watanabe as they delve into restorative techniques and materials currently used in Japan.





The Art and Science of Dentistry

Registration Information

August 15–17 at the Moscone South Convention Center in San Francisco Register at **cdapresents.com**

Here is some information you will be asked for when registering:

- Name
- Address
- Phone number
- Registration type
- License number (if applicable)
- Emergency contact person
- Ticketed courses/events to purchase
- Password
- Email address (used for username and instant confirmation)

For your convenience, you can choose to pick up your materials on site at eBadge Exchange. This flexible option gives the ability to make changes to your registration from your personal online dashboard at any time until July 12. Otherwise, register by June 13 to have materials mailed to you prior to the meeting. Remember, CDA dues must be current for 2013 to complete your registration as a member.

Please note: Registrations are not accepted over the phone.

On-site registration/bag and lanyard pickup

Moscone	South Convention Center
Thursday	6:30 a.m5:30 p.m.
Friday	6:30 a.m5:30 p.m.
Saturday	6:30 a.m4:30 p.m.

What is the cost for CDA dentists?

Zero. As a benefit of membership, the \$890 registration fee is waived for CDA dentists.

Staff and guests

Dentists may register staff and guests, but not other dentists. All dentists, including nonmembers must register as dentists.

If you register an employee who is no longer attending, you can exchange his/her badge on site for a new one at no charge.

One-time \$75 California nonmember rate*

Nonmembers can save \$815 with the \$75 one-time meeting registration fee.* If you were a CDA member in 2011 or 2012, you are not eligible for the one-time nonmember \$75 registration fee for 2013. Materials cannot be mailed in advance, but can be picked up at the designated area in registration.

*Any nonmember who has taken advantage of this offer in the past is not eligible. The rate is for one-time use only.

Registration deadlines

June 13, 2013: To have materials mailed prior to the show. Mailed registration forms will not be accepted if postmarked after June 13. Forms received after this date will be returned.

June 14 – Aug. 17, 2013: Online registration remains open and materials will be available at the eBadge Exchange booth at the Moscone South Convention Center.

CDA mails registration materials at least two weeks prior to the meeting. If you do not receive materials within this time frame, call CDA at 800.232.7645.

Cancellations and/or course changes can be made from your online registration dashboard or requested in writing until July 12, 2013. After this date, refunds will not be given. If badges and/or tickets have already been mailed, the appropriate materials must be returned with your refund request and postmarked by July 12 in order to be processed.

Mail refund requests to: CDA Presents 1201 K Street, 16th Floor Sacramento, CA 95814

Categories and Fees

Dentist registration categories

Registration Type	Pre-Reg. Fee	On-Site Fee
CDA member dentist (2013 dues must be current)	Free	Free
ADA lifetime member	Free	Free
Out-of-state ADA member dentist	\$200	\$225
International dentist	\$200	\$225
Active military dentist (VA, federal, state dentist)	\$75	\$100
CA nonmember dentist (one-time rate)	\$75	\$75
CA nonmember dentist	\$800	\$890
Inactive dental license	\$250	\$275
Dental student/CDA member	Free	Free
Dental student/graduate non-CDA member	\$25	\$50
Guest of dentist (includes ADHP nonmember)	\$5	\$25

Please note: Dentists may register staff and guests, age 11 or older, but not other dentists. Dentists may not register under any category except dentist, and nonmembers must be identified.

Allied Dental Health Professional categories (ADHP)

ADHP includes RDA, RDH, RDA(EF), RDH(EF), RDHAP, DA, business administrative staff (AS) and dental laboratory technician (LT).

Registration Type	Pre-Reg. Fee	On-Site Fee
ADHP CDA member* (2013 dues must be current)	Free	Free
ADHP Non-CDA member registering with a dentist	\$5	\$25
ADHP Non-CDA member registering without a dentist \$20 \$25		\$25
Guest of ADHP	\$20	\$25

*An ADHP member is a dental professional who is not a dentist but has an independent, paid 2013 membership with CDA.

Other registration categories

Registration Type	Pre-Reg. Fee	On-Site Fee
Non-exhibiting dental dealer, manufacturer, consultant	\$150	\$175
Non-dental professional (MD, DVM, RN, etc.)	\$150	\$175

Saturday exhibits-only pass

Nonmember dentists who want to explore the exhibit hall can register on site for a one-day pass on Saturday, Aug. 17. The cost is \$175 and is for Saturday exhibit hall hours only. It is not valid for continuing education courses. To register, please visit the membership counter during on-site registration hours on Saturday, Aug. 17. Then experience all that the *CDA Presents* exhibit hall has to offer.

The article, "Salt Fluoridation: A Review" by Howard F. Pollick, BDS, MPH, and letter to the editor from Jack Saroyan, DDS, discuss the advantages and disadvantages of using salt fluoridation. This issue is a complicated one, especially in the United States and within a state the size of California where 62 percent (approximately 70 percent by the year 2020) of the population receives fluoridation through community water fluoridation. As Dr. Pollick points out, a community-based alternative to water fluoridation, such as salt fluoridation, is used in many countries where there are few central water systems, water infrastructure is otherwise not appropriate or where other factors preclude the use of water fluoridation. It is also recommended that a national fluoride program use only one of these approaches¹ and the United States Centers for Disease Control and Prevention currently supports the national methodology of community water fluoridation.

California Dental Association policy currently supports community water fluoridation and its Policy Development Council will be reviewing that policy in July 2013 to consider whether to make a recommendation to its House of Delegates that the policy be broadened to include other appropriate efforts, as yet undefined, to assist those communities that may not be able to benefit from community water fluoridation.

Walter G. Weber, DDS, Chair, CDA Policy Development Council

1. Horowitz HS. Decision-making for national programs of community fluoride use. Community Dent Oral Epidemiol 2000;28:321–329



Salt Fluoridation: A Review

HOWARD F. POLLICK, BDS, MPH

ABSTRACT Salt fluoridation is sometimes suggested as a prospect for communities that have a low water fluoride concentration and have no possibility of implementing community water fluoridation. School-based milk fluoridation programs also are practiced in some countries as an alternative. This paper reviews the evidence of effectiveness in dental caries prevention and risks of dental fluorosis in countries where salt or milk fluoridation is practiced.

AUTHOR

Howard F. Pollick, BDS, MPH, is a full-time health sciences clinical professor and director of the Dental Public Health Residency Program, Department of Preventive and Restorative Dental Sciences at the University of San Francisco, School of Dentistry. Conflict of Interest Disclosure: None reported. he world's population exceeds 7 billion, yet fewer than 1 billion have access to a proven community-based water or salt fluoridation program to reduce the prevalence and severity of tooth decay, the most common chronic disease of children, which

common chronic disease of children, which may be untreated in as much as 95 percent of the population of some countries.¹ It is also anticipated that in light of changing living conditions and dietary habits, the global incidence of dental caries will increase, particularly as a result of growing consumption of sugars and inadequate exposure to fluoride.² Water fluoridation is practiced extensively in the United States, but not in communities that depend on nonpublic water supplies. In 2005, the Pan American Health Organization published a comprehensive book on salt fluoridation.³ Information from the book has been used for this paper, in addition to other published sources prior to and since that time. Rather than being a systematic review, this is a

selected review of published evidence on the current status of salt fluoridation. Meta-analyses of the caries preventive effect of salt fluoridation have demonstrated effectiveness in the permanent dentition,⁴ while a systematic review with strict criteria (such as only including randomized control and clinical trials) has been unable to find studies of sufficient quality.⁵ In 2009 the World Health Organization published a comprehensive book on milk fluoridation.⁶ Milk fluoridation programs are relatively small in scale and scope but show promise for providing appropriate fluoride exposure for the prevention of dental caries during vulnerable preschool and school years for children.

Water Fluoridation

Water fluoridation is practiced in many countries throughout the world. As of 2012, more than 435 million people worldwide have access to either naturally fluoridated water (about 57 million) or water with

TABLE 1

The Extent of Water Fluoridation in the U.S. and Other Countries: Population Served by Optimally Fluoridated Water

Country	Fluoridated water	
United States	204 million	
Brazil	73 million	
Malaysia	20 million	
Australia	17 million	
Canada	14 million	
Chile	11 million	
Hong Kong	7 million	
Great Britain	5.8 million	
Israel	5.3 million	
Singapore	5 million	
Spain	4.2 million	
Vietnam	3.5 million	
Ireland	3.2 million	
Argentina	3 million	
South Korea	2.8 million	
New Zealand	2.3 million	
Guatemala	1.8 million	
Peru	0.5 million	
Panama	0.5 million	
Others	52 million	
Total	435 million	

adjusted fluoride concentrations at or near optimal (about 378 million).⁷ These countries include the United States (204 million), Brazil (73 million), Malaysia (20 million), Australia (17 million), Canada (14 million), Chile (11 million), Hong Kong (7 million), Great Britain (5.8 million), Israel (5.3 million), Singapore (5 million), Vietnam (3.5 million), Ireland (3.2 million), Spain (3.2 million), Argentina (3 million), South Korea (2.8 million), New Zealand (2.3 million),

TABLE 2

Countries Using Salt Fluoridation

Continent	Country
Europe	Switzerland, France, Germany, Spain, Finland, Poland, Serbia, Czech Republic, Slovakia, Belgium, Denmark, Austria, Romania
North America	Mexico, Jamaica, Belize, Costa Rica, Cuba, Dominican Republic
South America	Colombia, Peru, Bolivia, Ecuador, Uruguay, Venezuela

Guatemala (1.8 million), Peru (0.5 million) and Panama (0.5 million)⁷ (TABLE 1).

Some countries, including China (more than 200 million), India (more than 60 million), Tanzania (12 million), Mexico (3 million), Sri Lanka (2.8 million), Zimbabwe (2.6 million) and several more, have fluoride levels in water significantly in excess of the optimum.⁷

Salt Fluoridation

Salt fluoridation is practiced as a community-based alternative to water fluoridation in many countries where there are few central water systems, water infrastructure is otherwise not appropriate or where other factors preclude the use of water fluoridation. It is recommended that a national fluoride program use only one of these approaches.8 It has been estimated that between 40 million and 280 million people worldwide use salt fluoridation, mainly in European, South American and Central American countries.^{9,10,11} Some Asian countries, including Cambodia and Laos have recently adopted salt fluoridation.¹² In Africa, Madagascar has also implemented salt fluoridation.13

If salt fluoridation is identified as the preventive method to use in a country, it is necessary to do a thorough assessment of drinking water sources to identify communities or regions where fluoridated salt should not be distributed. For example, in Mexico, which has a national salt fluoridation program, fluoridated salt is not distributed in four Mexican states that tend to have appreciable concentrations of fluoride in their drinking water sources.¹⁴

Fluoride Concentration in Salt

For salt fluoridation, potassium fluoride and sodium fluoride are used at a concentration of 250-300 mg F per kg of salt (250-300 ppm).¹⁵ At this concentration, the level of fluoride in saliva was very similar to that found in the saliva of individuals exposed to water fluoridation at 1 mg/l.¹⁵ The concentration of 200 mg/ kg of fluoride is regarded as the minimal acceptable level of fluoride in salt to achieve a meaningful effect on caries control. Most of the studies designed for monitoring salt fluoridation use urine as a biomarker to monitor compliance of individuals with a salt fluoridation program, as well as possible excessive fluoride ingestion.

Fluoridated salt was introduced in Switzerland in the 1950s based on the success of the use of iodized salt to prevent goiter. Switzerland had iodized salt since 1922, so salt fluoridation for the prevention of dental disease, based on experiences of fluoride in the prevention of dental caries, was considered a valid approach.¹⁶ The objective of any fluoridation method in the 1950s was to promote the ingestion of fluoride in order to achieve its cariostatic effect. The concept of using salt fluoridation has a different aim today, which is to reach communities and regions in the world where oral care prevention measures, and particularly fluoride toothpastes, are not available.¹⁵

In addition to iodide and fluoride, folic acid is added to salt in some countries, including Germany.¹¹ Folic acid is added to help prevent spina bifida and other neural tube defects during pregnancy. In 1998, the Food and Drug Administration began requiring the fortification of enriched cereal grain products with folic acid.¹⁷ Neither folic acid nor fluoride is added to salt in the U.S.

Effectiveness in Caries Prevention

The first epidemiological studies to evaluate the effectiveness of fluoridated salt in reducing caries prevalence were performed in Colombia, Hungary and Switzerland from around 1965 to 1985. The outcomes of these studies indicated that salt fluoridation generally showed very similar beneficial results to those observed for water fluoridation; the number of teeth affected by caries was reduced by approximately 50 percent.¹⁸ The results of the early clinical experiments by Toth performed in Szeged, Hungary, showed, after 17 years, a caries reduction of about 66 percent.¹⁹

In a 1991 study from Hungary, adults were shown to benefit from fluoridated salt, where three groups were examined for dental caries status.²⁰ One group were lifetime residents in a community with access to 1.1 ppm natural fluoride in the drinking water (N=205; lowest caries experience), another group had access to fluoridated salt between 1966 and 1985 (N=213; intermediate caries experience) and a third group had minimal fluoride exposure (N=258; highest caries experience).

Availability

Salt fluoridation is available in nearly all Latin American countries, except Brazil, Chile and Panama. There are national regulations or authorizations for the production and marketing of fluoridated salt in eight European countries: Austria, Czech Republic, France, Germany, Romania, Slovakia, Spain and Switzerland.¹⁵ In Europe, where there are major discounters, there are safeguards regarding importation of fluoridated salt across borders. There are many variants of the commercial distribution or "channels" to reach the consumer. These channels include, domestic salt, meals at schools, large kitchens and in food items such as bread. The most extensive use of fluoridated salt is in Jamaica, Costa Rica and the canton of Vaud, Switzerland.¹⁸ In other Swiss cantons, France and Germany, the salt fluoridation program is mainly based on domestic salt.

Planning new salt fluoridation programs requires mapping of the natural fluoride content of water, and necessary measures to keep fluoridated salt away

> NO ADVERSE health effects have been reported related to the use of fluoridated salt.

from regions with more than 0.7 ppm F in water.¹⁸ Marthaler and Petersen have reviewed the various technical issues associated with initiating and maintaining salt fluoridation programs.¹⁸ As with water fluoridation, where salt fluoridation appears feasible, there will be regulatory and organizational issues to resolve.¹⁸

Concerns About Salt Use

One point of concern is that promoting salt fluoridation could be contraindicated from the perspective of general public health, because greater salt consumption is linked to hypertension. However, people do not need to change their usual behavior to benefit, and if a secular decline in salt consumption were to take place, an increase in fluoride concentration could be considered. Preventing hypertension through restricting salt intake and eliminating iodine deficiency through iodized salt are not in conflict. It is estimated that among communities or groups usually consuming low-salt diets (<5 g NaCl per person per day), essential hypertension will be uncommon. Estimates of normal daily salt requirements for adults have ranged up to 15 g per day.¹⁵

There is a wide margin of safety regarding fluoride intake from fluoridated salt. It is estimated that fluoride intake from fluoridated salt is 0.5–0.75 mg per day.¹¹ The upper tolerable limit for fluoride intake has been estimated to be 0.12 mg/ kg/day, which is equivalent to about 5 mg/day for children aged 9–14 years and 7 mg/day for aged 15 and older, including pregnant and lactating women.¹¹ No adverse health effects have been reported related to the use of fluoridated salt.¹¹

No adverse impact has been identified in combining iodide and fluoride in salt.¹¹

Costs

The equipment costs for the initial operation of implementing salt fluoridation are similar to those for water fluoridation. However, during operation, salt fluoridation has an estimated cost 10 to 100 times lower than that associated with water fluoridation programs. The costs of salt fluoridation can vary from USD 0.015 up to USD 0.030 per capita/year, which is so low that many producers do not raise the price of the product after fluoridation is implemented.¹⁵ Gillespie and Marthaler reported a cost of USD 2.5 to 5.0 for sodium fluoride chemical per ton of salt.²¹

Ethics: Choice

In contrast with water fluoridation, which is readily available to the whole community, salt fluoridation can provide a choice for the consumer. According to Jones et al.,²² the individual choice is

Some folks didn't believe.

Apple would transform consumer electronics.
Google would transform the way we use computers.
Starbucks would transform the retail business model.
Nike would transform leisure time.

We want to team up with you to transform private dental practice management.

See how.

Visit | www.stratusdental.com/cda Call | 888.708.8639 Email | info@stratusdental.com



ALL MANDER MARGER A HAN TOLKH CHICK / / / and didn't believe, 19 ter believe. Some fok nerve. Believe. Some **Now it's your turn.** certebelieve. Some the Pare, Some folks and 1 HAR OF HARDEN O 16 MARTE DELICITE STATE TERRITOR MINING 1/15 CHINE MULTINE

one positive aspect of a fluoridated salt program because it can be sold alongside a nonfluoridated alternative. Individual choice makes salt fluoridation more acceptable for some people from ethical and social policy perspectives. On the other hand, it can weaken its cariespreventive impact because salt is not used similarly on an individual basis.

Combination of Multiple Fluoride Sources

As with fluoridated water, there has been some concern about the simultaneous combination of fluoride ingested from both salt and dentifrice. Available data suggest that this combination has not resulted in objectionable enamel fluorosis levels. However, increased mild dental fluorosis was observed in children who used fluoride tablets in association with fluoridated salt.¹⁵

Dental Fluorosis

Fluoride-associated opacities of enamel are caused by excessive fluoride intake during enamel development in the first years of life. The mildest form of dental fluorosis manifests as white horizontal lines in enamel and/ or "snow caps" on the incisal edges and cusps of teeth. While this condition is not considered objectionable, should the condition be more severe, which is rare, there is a desire to reduce the sources of fluoride that contribute to the objectionable forms. However, it has been shown that teeth with fluorosis are at reduced risk for tooth decay.²³

Dental fluorosis has been studied extensively. In Switzerland, the neighboring cantons Basel-Stadt and Basel-Landschaft had introduced different fluoridation schemes for caries prevention. Basel-Stadt provided drinking water fluoridated at 0.8–1 ppm F from 1962, while Basel-Landschaft introduced fluoridated domestic salt (250 ppm F from 1983). Representative samples of 12-year-old schoolchildren were studied to evaluate the prevalence of dental fluorosis, nonfluoride-associated enamel opacities and hypoplasia of the incisors using standardized photographs.²⁴ More than 800 children were examined between 1999-2001. In spite of different fluoridation schemes in the two cantons, the prevalences of dental fluorosis were

THE MILDEST FORM of dental fluorosis manifests as white horizontal lines in enamel and/or "snow caps" on the incisal edges and cusps of teeth.

identical; most fluoride-associated enamel opacities were mild or very mild. The authors concluded they did not represent an esthetic problem and certainly not a public health concern.²⁴

Dental fluorosis was assessed among Swiss army recruits from all cantons and third and fourth grade children in the canton of Zurich between 1996 and 2006.²⁵ Demonstrating the difficulty of assessing dental fluorosis and nonfluoride-associated enamel opacities, even using a blinded approach using photographs, the two examiners differed in their assessments, one finding an overall fluorosis prevalence of 22.7 percent and the other examiner only 9.0 percent. It was noted that the prevalence of dental fluorosis as assessed by each examiner had declined for both age groups, even though the salt fluoride concentration of salt had increased from 90 mg/kg to 250 mg/kg in 1983. However, there had been significant reduction in other fluoride sources; fluoride tablets had declined in use in the intervening years and from 1986, low fluoride toothpaste (250 ppm) became available for children increasing in use for the latter cohort.²⁵

Europe

Switzerland

The market share of fluoridated salt in Switzerland is more than 80 percent.¹¹ Basel, Switzerland, was successfully fluoridating its water supply for many years, while the surrounding cantons were distributing fluoridated salt. In 2003, the Basel parliament voted to cease water fluoridation because of the complexity of fluoridated salt distribution — it was no longer possible for the people of Basel to avoid purchasing fluoridated salt.²⁶ In addition, some surplus Basel water was being purchased by neighboring communities in France.

France

Salt fluoridation, available since 1986 in France, has been weakly promoted and is used by less than 30 percent of schoolchildren.²⁷ While the market share was 60 percent in 1993 it dwindled to 14 percent in 2009.11 In a 2003-2004 study of 282 4 and 5-year-olds and their parents in Clermont-Ferrand, a deprived community in central France, the mean dental caries experience showed mean number of decayed and filled primary teeth (dft) was 1.94 (SD 3.31) and 30 percent of the children had >1 carious teeth.²⁷ Children whose parents did not know what kind of salt they used experienced more dental caries. However, the authors suggest that it is the level of

parental knowledge that is associated with the dental status of the children rather than the F salt consumption. Several previous studies conducted in France have failed to find a significant relationship between fluoridated salt use and dental status. The poor level of use of fluoridated salt in France, particularly among low socioeconomic status families reduces the potential preventive effect of this measure. Fluoridated salt is recommended as well as fluoride supplements for highrisk children after the age of 6 months. Two-thirds of the children had used fluoride supplements from birth to age 2. Children who had never used fluoride supplements had more carious teeth than other children did. Children whose parents knew that toothpastes were fluoridated had fewer decayed teeth.²⁷

Germany

Fluoridated salt was introduced in Germany in 1991 and the market share is reported as 65-70 percent.11 Tooth decay has declined among 12-year-old German children from a mean number of decayed, missing and filled permanent teeth (DMFT) of 2.4 in 1994 when there was only a 5 percent market share of fluoridated domestic salt to 1.0 DMFT in 2004 with a 61 percent share. However, during this time there was an increase in the percent of children receiving dental sealants from 6 percent to 66 percent. Parenthetically, it should be noted that there has been an increase in sealant application in communities with water fluoridation.²⁸ This may be related to the decline in smooth-surface and approximal caries as a result of increased fluoride exposure which then allows for sealant application to prevent pit and fissure caries on the particularly vulnerable occlusal surfaces of otherwise caries-free permanent molars.

Spain

The market share of fluoridated salt in Spain is low and was reported to be only 10 percent in 2006.¹¹ This may be due in part to the fact that some regions of Spain have community water fluoridation programs accessed by more than 4 million people.

North America

Mexico

Mexico began a fluoridated salt program in 1991. Of the total Mexican population of 112 million in 2010, an estimated 90 million had access to fluoridated salt, with another 20 million with access to water with naturally occurring fluoride concentrations at or above optimal.¹¹ A cross-sectional study was conducted in 1998 of 1,373 6 to 12-year-old (mean 8.8 years) lifetime residents attending elementary schools in the city of Campeche in southeast Mexico.²⁹ Fluorosis prevalence was 51.9 percent overall, with increasing prevalence among cohorts born after 1990, particularly among those born in 1991 (71.4 percent prevalence) and 1992 (86.7 percent prevalence). The authors of the study propose that there was increased consistency in the concentration of fluoride in salt after 1993. The study also confirmed previous reports with regard to toothbrushing frequency, as well as type and quantity of toothpaste, being risk factors for dental fluorosis. A review of 14 studies in Mexico found that the prevalence of dental fluorosis ranged from 30 percent to 100 percent in areas where water is naturally fluoridated at or above optimal concentration and from 52 percent to 82 percent in areas where fluoridated salt is used.³⁰ Fluorosis risk increases where natural fluoride concentrations in water

are relatively high and fluoridated salt is also being used.³¹ Children living at high altitudes experience increased risk for dental fluorosis.³² Further studies have been recommended to determine if the prevalence of dental fluorosis in Mexico is rising or if it constitutes a public health problem.

Jamaica

A salt fluoridation program started in Jamaica in 1987. The salt fluoridation program was considered appropriate for the island because of geographical conditions, the low concentrations of water-borne fluoride (which do not exceed 0.3 mg/l) and the availability of bottled water also having the same levels of fluoride. A recent study observed that 96 percent of rural and 100 percent of urban Jamaican children in the sample were consuming fluoridated salt.¹⁵ The oral health survey conducted in 1995 indicated a significant decline in dental caries compared with findings in 1984. The major change in Jamaica during the interval was the 1987 introduction of salt fluoridation. Dental fluorosis was low in the 1995 survey.³³ Fluoridated toothpaste first became available in 1972, 15 years before fluoridated salt was introduced. Data were not available on the use of fluoride toothpaste in Jamaica between the 1984 baseline and 1995.³³

However, a more recent study in 2006 of the dental caries and fluorosis status of 5- and 6-year-olds and 11- and 12-year-olds found that every Jamaican child reported using imported fluoridated toothpaste.³⁴ It is therefore possible that there could have been an increase in the use of fluoridated toothpaste during the 1995 survey that could have also contributed to the decline of dental caries. A high level of dental fluorosis, particularly in the 6-year-olds was found in the 2006 study that did not seem

TABLE 3

Countries Using Milk Fluoridation on a Limited Basis

Bulgaria
Chile
China
Peru
Russia
Thailand
United Kingdom

to be predominately associated with waterborne fluoride, but could be associated with fluoride toothpaste use.³⁴ However, age 6 is younger than the age recommended for typical dental fluorosis studies,³⁵ as few permanent teeth would have erupted.

Fluoride exposure in recent years appears to be close to optimal. In 2008, nocturnal and diurnal urinary fluoride concentrations in a sample of urban (N=64; mean age 4.6 years) and rural (N=64;mean age 4.8 years) Jamaican children were found to be almost twice as high as was found in a similar 1987 study (when salt fluoridation started), yet considered to correspond to low fluoride intake.³⁶ The excreted fluoride mirrors the intake from all sources of fluoride. not only from fluoridated salt. Concerning fluoride toothpaste use, 76.5 percent in urban areas and 89 percent of rural children used adult toothpaste (1000-1100 ppm F). Regarding quantity of toothpaste placed on the toothbrush parents of urban children indicated that 58.6 percent used too much (more than a pea-size), 27.6 percent excessive (the entire head of the brush covered with toothpaste) and only 13.8 percent used a pea-size amount. In rural children, 70.2 percent use too much, 14.9 percent excessive and 14.9 percent a pea-size amount. All children of the sample were living in regions with less than 0.4 ppm F in the drinking water. With regard to dental fluorosis, the

authors conclude in citing other studies, that the combination of fluoride used in both dentifrices and salt, does not lead to objectionable enamel fluorosis levels.³⁶

South America

Colombia

A fluoridated salt trial was initiated in Colombia in 1963 and upon successful completion in 1972 was shown to have preventive results comparable to water fluoridation.¹⁶

Peru

In 1984, a law was passed in Peru mandating the addition of fluoride to salt for human consumption. In 1985, the Peruvian Ministry of Health agreed on a technical norm for enriching table salt for human consumption with F, as the main method for administering F to the Peruvian population. Fluoridated salt is widely available to consumers at supermarkets and retail stores throughout the country.³⁷

Comparison of Data from Various Studies from Different Countries

In addition to Colombia and Peru, there are fluoridated salt programs in Belize, Bolivia, Costa Rica, Cuba, Dominican Republic, Ecuador, Uruguay and Venezuela.¹¹ A study in Costa Rica found a 72 percent reduction in the mean number of decayed, missing and filled permanent teeth (DMFT) of 12-year-olds from 8.4, in 1987 when salt fluoridation started, to 2.5 in 1999.¹¹ Another study in Uruguay showed a 41 percent reduction in DMFT for 11- to 14-year-olds between when salt fluoridation started in 1991 to 1999.¹¹

Data are rarely collected on dental caries and fluorosis status that are representative of the country or state. The World Health Organization Examiners have also differed in their assessments of the same population sample using the same methods, while studies in different countries may also use somewhat different methods. Additionally. there have been changes in the practice of dentistry in some countries, particularly for young children, with an increase in the use of stainless steel crowns for primary teeth, increasing the number of tooth surfaces designated as filled when using dfs or DFS indices. Thus, comparison of data from different countries is not too meaningful when attempting to determine the reasons behind trends. Yet that has not prevented comparisons being made.^{38,39} While many trends have shown a decline in dental caries prevalence and severity, others have focused on studies from countries that show an increase.³⁹ A review published in 1999 found that dental caries was a good proxy measure for socioeconomic development and that countries in the throes of socioeconomic transition had the highest DMFT scores.⁴⁰ The World Health Organization has established an Oral Health Database providing mean DMFT scores for 12-year-olds.³⁸ A weighted average of scores indicates that the year 2000 goal of reducing the mean DMFT for 12-year-olds to no more than three permanent teeth affected by tooth decay had been achieved by 70 percent of 128 countries in 2001 and by 78 percent of 189 countries in 2011.

Milk Fluoridation

The distribution and consumption of fluoridated milk in preschools and schools provides a cost-effective alternative when water or salt fluoridation are not feasible.⁴¹ While the 2012 U.S. standards for school meals includes fat-free or low-fat milk,⁴² fluoridated milk is not currently available in the U.S. However, fluoridated milk is available to almost 1 million schoolchildren in parts of Bulgaria, Chile, China, Peru, Russia, Thailand and the United Kingdom.^{43,44} In Louisiana, there were two small clinical trials of milk fluoridation, one started in 1955 and the other in 1982.⁴⁵ Both showed benefits of caries reduction compared to control groups. Overall, there have been 20 reports of 15 studies in 10 countries showing effectiveness of milk fluoridation in prevention of dental caries in primary teeth (eight of 10 studies) and in permanent teeth in 10 studies.⁴⁶

Milk fluoridation for the prevention of dental caries was first proposed in the 1950s.⁴⁷ It has been demonstrated in an economic analysis that milk provides a relatively cost-effective vehicle for fluoride in the prevention of dental caries.⁴⁴

A Cochrane review of studies in 2005 on the benefits of fluoridated milk in preventing dental caries found that there were insufficient good-quality studies.44 However, the included studies suggested that fluoridated milk was beneficial to schoolchildren, especially their permanent dentition.44 Two randomized controlled trials (RCTs) involving 353 children were included. For permanent teeth, after three years there was a significant reduction in the DMFT (78.4 percent, P < 0.05) between the test and control groups in one trial, but not in the other. The latter study only showed a significant reduction in the DMFT until the fourth (35.5 percent, P < 0.02) and fifth (31.2 percent, P <0.05) years. For primary teeth, again there was a significant reduction in the dmft (31.3 percent, P < 0.05) between the test and control groups after three years in one study, but not in the other. The results could not be pooled because of the difference in concentration of fluoride in the milk.⁴⁴ A subsequent systematic review published in 2012 concluded that there is low evidence that the use of milk fluoridation is effective in reducing the caries increment.5 Further research has been recommended to determine the

age at which it is best to start drinking fluoridated milk, how many years milk consumption should continue, the frequency of consumption and the optimum concentration of fluoride.⁴⁴

Fluoridation of milk has been recommended as a caries preventive measure where the fluoride concentration in drinking water is suboptimal, caries experience in children is significant and there is an existing school milk program. It has been recommended that the program should aim to provide fluoridated milk for at least 200 days per year and should commence before the children are 4 years of age.⁴⁷ The fluoride concentration of the fluoridated milk has ranged from 2.5 to 7.5 mg/L.⁴⁴ Children consumed the milk using a cup in one study and a straw in another.

Conclusions

The advantages of using salt as a vehicle for delivering fluoride outweigh the drawbacks related to this method, such as variation in ingestion, difficulties in maintaining the ideal concentration and concerns with hypertension.¹⁵ Owing to the risk of increased fluoride intake from both fluoridated water and fluoridated salt, it is recommended that one or the other be used in individual countries. Countries where both are used have shown a higher prevalence of dental fluorosis or a resistance in promotion and distribution of fluoridated salt. In the U.S. where water fluoridation is extensively practiced, the alternative for those in nonfluoridated communities is the prescription of fluoride supplements for children at high risk for tooth decay. Water fluoridation is strong official policy of the World Health Organization; salt fluoridation and milk fluoridation are highly relevant alternatives if water fluoridation is not possible.48

REFERENCES

 Beaglehole R, Benzian H, Crail J, Mackay J. The Oral Health Atlas: mapping a neglected global health issue. FDI World Dental Federation. Myriad Editions. 2009. Accessed at issuu.com/myriadeditions/docs/flipbook_oral_health.
 J Banoczy, PE Petersen, AJ Rugg-Gunn (Editors). Milk fluoridation for the prevention of dental caries. World Health Organization, 2009.

3. Estupinan-Day S. Promoting Oral Health: The use of salt fluoridation to prevent dental caries. Pan American Health Organization (PAHO) 2005. Scientific and Technical Publication No. 615.

4. Yengopal V, Chikte UM, Mickenautsch S, Oliveira LB, Bhayat A. Salt fluoridation: a meta-analysis of its efficacy for caries prevention. *SADJ* 2010 Mar;65(2):60-4, 66-7. Abstract accessed at www.ncbi.nlm.nih.gov/ pubmed/20527578.

 Cagetti MG, Campus G, Milia E, Lingström P. A systematic review on fluoridated food in caries prevention. Acta Odontol Scand 2012 Jul 25. [Epub ahead of print]
 J Banoczy, PE Petersen, AJ Rugg-Gunn (Editors). Milk fluoridation for the prevention of dental caries. World Health Organization, 2009.

 Pritish Fluoridation Society. One in a Million: the facts about water fluoridation. 3rd edition. March 2012. Accessed at www.bfsweb.org/onemillion/onemillion2012.html.
 Horowitz HS. Decision-making for national programs of community fluoride use. *Community Dent Oral Epidemiol* 2000;28:321–329.

9. Petersen PE. The World Oral Health report 2003: continuous improvement of oral health in the 21st century the approach of the WHO Global Oral Health Programme. *Community Dent Oral Epidemiol* 2003;31(Suppl 1):3–24. 10. Mariño RJ, Fajardo J, Arana A, Garcia C, Pachas F. Modeling an economic evaluation of a salt fluoridation program in Peru. *J Public Health Dent* 2011 Spring;71(2):125-30.

11. Marthaler TM, Gillespie GM, Goetzfried F. Salt fluoridation in Europe and in Latin America – with potential worldwide. Wirstschaft. *Kali Und Steinsalz Heft* 3/2011. Accessed at www.eusalt.com/pages/press-corner/file. handler?f=111109%2520-%2520German%2520Journal%25 20'Kali%2520und%2520Steinsalz'%2520-%2520Salt%25 20Fluoridation%2520Steinsalz'%2520-%2520Salt%25 20Fluoridation%2520(Print%2520Version).pdf. 12. Petersen PE, Baez RJ, Lennon MA. Community-oriented administration of fluoride for the prevention of dental caries: a summary of the current situation in Asia. *Adv Dent Res* 2012 Feb;24(1):5-10.

13. Petersen PE, Phantumvanit P. Toward effective use of fluoride in Asia. Adv Dent Res 2012 Feb;24(1):2-4. 14. Estupiñan-Day S. Overview of salt fluoridation in the Region of the Americas, Part I: Strategies, cost-benefit analysis and legal mechanisms utilized in the national programs of salt fluoridation. In: Proceedings of Salt 2000– 8th World Health Symposium, The Hague, The Netherlands, 2000.

15. Sampaio FC, Levy SM. Systemic fluoride. *Monogr Oral Sci* 2011;22:133-45.

16. Gillespie GM, Baez R. Development of salt fluoridation in the Americas. Schweiz Monatsschr Zahnmed

2005;115(8):663-9. Accessed at www.sso.ch/doc/doc_ download.cfm?uuid=95531E4CD9D9424C4F11EB2E1FCFF3 25&&IRACER_AUTOLINK&&.

17. Erickson JD. Folic acid and prevention of spina bifida and anencephaly. 10 years after the U.S. Public Health Service recommendation. *MMWR Recomm Rep* 2002 Sep 13;51(RR-13):1-3. Accessed at www.cdc.gov/mmwr/preview/ mmwrhtml/rr5113a1.htm.

 Marthaler TM, Petersen PE. Salt fluoridation – an alternative in automatic prevention of dental caries. *Int Dent J* (2005) Vol. 55/No.6. 351-358. Accessed at www.who. int/oral_health/publications/orh_IDJ_salt_fluoration.pdf.
 Banoczy J; Fazekas A; Mari A; Pinter A; Szabo J; Szoke J. [Recommendation of the introduction of salt fluoridation for caries prevention in Hungary]. *Fogorv Sz* 1997 Dec, 90(12):351-8.

20. Radnai M, Fazekas A. Caries prevalence in adults seven years after previous exposure to fluoride in domestic salt. *Acta Med Dent* 1999 4: 163-166.

 Gillespie GM, Marthaler TM. Cost aspects of salt fluoridation. *Schweiz Monatsschr Zahnmed* 2005;11:778-84.
 Jones S, Burt BA, Petersen PE, Lennon MA. The effective use of fluorides in public health. *Bull World Health Organ* 2005 Sep;83(9):670-6.

23. lida H, Kumar JV. The association between enamel fluorosis and dental caries in U.S. schoolchildren. *J Am Dent Assoc* 2009 Jul;140(7):855-62.

24. Büchel K, Gerwig P, Weber C, Minnig P, Wiehl P, Schild S, Meyer J. Prevalence of enamel fluorosis in 12-year-olds in two Swiss cantons. *Schweiz Monatsschr Zahnmed* 2011;121(7-8):647-56.

25. Steiner M, Menghini G, Thomet E, Jäger A, Pfister J, Imfeld T. Assessment of dental fluorosis prevalence in Swiss populations. *Schweiz Monatsschr Zahnmed* 2010;120(1):12-20. Accessed at www.sso.ch/doc/doc_download.cfm?uuid=50B2C3E6D087E89E4621FA56CAC F91F3.

26. Meyer J, Marthaler TM, Burgi H. The change from water to salt as the main vehicle for community-wide fluoride

exposure in Basle, Switzerland (Editorial). Comm Dent Oral Epidemiol 2003;31(6):401-2.

27. Tubert-Jeannin S, Riordan PJ, Manevy R, Lecuyer MM, Pegon-Machat E. Caries prevalence and fluoride use in low SES children in Clermont-Ferrand (France). *Community Dent Health* 2009 Mar;26(1):23-8.

 Armfield JM, Spencer AJ. Community effectiveness of fissure sealants and the effect of fluoridated water consumption. *Community Dent Health* 2007;24(1):4–11.
 Vallejos-Sánchez AA, Medina-Solís CE, Casanova-Rosado JF, Maupomé G, Minaya-Sánchez M, Pérez-Olivares S. Dental fluorosis in cohorts born before, during, and after the national salt fluoridation program in a community in Mexico. *Acta Odontol Scand* 2006 Aug;64(4):209-13.
 Soto-Rojas AE, Ureña-Cirett JL, Martínez-Mier EA. A review of the prevalence of dental fluorosis in Mexico. *Rev Panam Salud Publica* 2004 Jan;15(1):9-18.

31. García-Pérez A. Irigoyen-Camacho M.E. Borges-Yáñez A. Fluorosis and Dental Caries in Mexican Schoolchildren Residing in Areas with Different Water Fluoride Concentrations and Receiving Fluoridated Salt. Caries Res 2013;47:299–308.

2013, 47259 500.
32. Pontigo-Loyola AP, Islas-Márquez A, Loyola-Rodríguez JP, Maupome G, Marquez-Corona ML, Medina-Solis CE.
Dental fluorosis in 12- and 15-year-olds at high altitudes in above-optimal fluoridated communities in Mexico. J Public Health Dent 2008 Summer;68(3):163-6.

33. Estupiñán-Day SR, Baez R, Horowitz H, Warpeha R, Sutherland B, Thamer M. Salt fluoridation and dental caries in Jamaica. *Community Dent Oral Epidemiol* 2001 Aug;29(4):247-52.

34. Meyer-Lueckel H, Bitter K, Hopfenmuller W, Paris
S. Reexamination of Caries and Fluorosis Experience of Children in an Area of Jamaica with Relatively High Fluorosis Prevalence. *Caries Res* 2009;43:250-253.
35. HT Dean and E Elvove. Further studies on the minimal threshold of chronic endemic dental fluorosis. *Pub Health Rep* 1937, 52:1249-1264.

36. Baez RJ, Marthaler TM, Baez MX, Warpeha RA.



Take Advantage of Alberta's Strong Economy Let's be honest. You didn't become a dentist so you could peruse spreadsheets all day.

Let's be honest. You didn't become a dentist so you could peruse spreadsheets all day. At Dental Choice, we're offering associate positions and ownership opportunities that let you focus on your strengths as a dentist. Leave the business part to us and we'll help you enjoy a better work/life balance: freeing you up to work hard and to better serve your patients. In addition, Alberta's economy is one of the strongest in Canada with many opportunities. For more information about joining the Dental Choice team visit us at: www.successfulDentists.ca

Positions available in Edmonton, Calgary and Airdrie



Twitter: @DentistSuccess Dentists@dentalchoice.ca Urinary fluoride levels in Jamaican children in 2008, after 21 years of salt fluoridation. *Schweiz Monatsschr Zahnmed* 2010;120(1):21-8. Accessed at www.sso.ch/doc/ doc_download.cfm?uuid=50A098319D2F9D1B5265F5068 D346C4E.

37. Mariño RJ, Fajardo J, Arana A, Garcia C, Pachas F. Modeling an economic evaluation of a salt fluoridation program in Peru. J Public Health Dent 2011 Spring;71(2):125-30.

38. World Health Organization. Global Oral Health Database. Global DMFT for 12-year-olds: 2011. Accessed at www.mah.se/CAPP/Country-Oral-Health-Profiles/ According-to-Alphabetical/Global-DMFT-for-12-yearolds-2011/.

39. Bagramian RA, Garcia-Godoy F, Volpe AR. The global increase in dental caries. A pending public health crisis. Am J Dent 2009 Feb;22(1):3-8. Accessed at www.amjdent.com/ Archive/2009/Bagramian%20-%20February%202009.pdf. 40. Lalloo R, Myburgh NG, Hobdell MH. Dental caries, socioeconomic development and national oral health policies. Int Dent J 1999 Aug;49(4):196-202.

41. Borrow Foundation. Cost of fluoridated milk. Accessed at www.borrowfoundation.org/why-fluoridate-milk/cost-of-fluoridated-milk.html.

42. USDA. News release. USDA Unveils Historic Improvements to Meals Served in America's Schools. Release No. 0023.12. Jan. 25, 2012. Accessed at www.usda. gov/wps/portal/usda/usdahome?contentid=2012/01/0023. xml&contentidonly=true.

43. J Banoczy, PE Petersen, AJ Rugg-Gunn (Editors). Milk fluoridation for the prevention of dental caries. World Health Organization, 2009.

44. Yeung A, Hitchings JL, Macfarlane TV, Threlfall A, Tickle M, Glenny A-M. Fluoridated milk for preventing dental caries. Cochrane Database of Systematic Reviews 2005, Issue 3. Art. No.: CD003876. DOI: 10.1002/14651858. CD003876.pub2.

45. J Banoczy, PE Petersen, AJ Rugg-Gunn (Editors). Milk fluoridation for the prevention of dental caries. World Health Organization, 2009.

46. J Banoczy, PE Petersen, AJ Rugg-Gunn (Editors). Milk fluoridation for the prevention of dental caries. World Health Organization, 2009.

47. Bánóczy J, Rugg-Gunn AJ. Caries prevention through the fluoridation of milk. A review. *Fogorv Sz* 2007 Oct;100(5):185-192, 177-84. Abstract accessed at www.ncbi. nlm.nih.gov/pubmed/18078140.

48. Petersen PE. Improvement of global oral health the leadership role of the World Health Organization. Community Dent Health 2010 Dec;27(4):194-8. Accessed at www.mah.se/upload/fakulteter/OD/Avdelningar/who/doc/ Global%20Oral%20Health.pdf.

THE CORRESPONDING AUTHOR, Howard F. Pollick, BDS, MPH, can be reached at howard.pollick@ucsf.edu.



This is why you do what you do.

Whether you're easing their fears or helping them smile with more confidence, caring for people and making a difference in their lives is why you became a dentist. And behind you all the way is the California Dental Association. Twenty-five thousand of your peers working to protect the profession, champion new ideas and provide helpful resources so that you can continue to do what you love—care for your patients.





Dental caries is out of control.



COMPLETE DIAGNOSTIC AND TREATMENT SYSTEM

We are not okay with that.

JOIN CARIFREE IN DOING SOMETHING ABOUT IT!

Schedule a free CariFree consultation and we will send you a complimentary copy of Balance.

Visit **start.carifree.com** or call 866.928.4445

Limit one free book per person, US only





CAD/CAM Complete Dentures: A Review of Two Commercial Fabrication Systems

MATHEW T. KATTADIYIL, DDS, MDS, MS; CHARLES J. GOODACRE, DDS, MSD, MS; AND NADIM Z. BABA, DMD, MSD

ABSTRACT The use of computer-aided design and computer-aided manufacturing (CAD/CAM) has become available for complete dentures through the AvaDent and Dentca systems. AvaDent uses laser scanning and computer technology. Teeth are arranged and bases formed using proprietary software. The bases are milled from prepolymerized pucks of resin. Dentca uses computer software to produce virtual maxillary and mandibular edentulous ridges, arrange the teeth and form bases. The dentures are fabricated using a conventional processing technique.

AUTHORS

Mathew T. Kattadiyil, DDS, MDS, MS, is a diplomate of the American Board of Prosthodontics and a fellow of the American College of Prosthodontists. He is currently the director of the Advanced Specialty Education Program in Prosthodontics at Loma Linda University School of Dentistry. Conflict of Interest Disclosure: None reported.

Charles J. Goodacre, DDS, MSD, MS, is a diplomate of the American Board of Prosthodontics and a fellow of the American College of Prosthodontists. He is currently professor and dean at Loma Linda University School of Dentistry. Conflict of Interest Disclosure: None reported.

Nadim Z. Baba, омо,

MSD, is a diplomate of the American Board of Prosthodontics and a fellow of the American College of Prosthodontists. He is currently professor of Restorative Dentistry at Loma Linda University School of Dentistry. *Conflict of Interest Disclosure: None reported.* omputer-aided design and computer-aided manufacturing (CAD/CAM) technology has been used for the fabrication of inlays, crowns, fixed partial dentures, implant abutments/prostheses and maxillofacial prostheses. CAD software renders the geometrical shape of an object. CAM software directs the fabrication process.

Recently, CAD/CAM technology has become commercially available for fabrication of complete dentures through the introduction of AvaDent digital dentures (Global Dental Science LLC, Scottsdale, Ariz.) and the Dentca CAD/ CAM system (Dentca Inc., Los Angeles). Instead of a five-appointment process used with conventionally fabricated complete dentures, the CAD/CAM systems use a two-appointment technique whereby impressions, interocclusal records and tooth selection can be completed in one appointment. The dentures are then fabricated using CAD/ CAM technology and placed at the second appointment.

The CAD/CAM process offers significant advantages to the dental practitioner and the patient. Because it is possible to record all the clinical data in one appointment (one to two hours), chair time is reduced considerably, thereby providing the opportunity for a more cost-effective set of appropriately accurate complete dentures. A repository of digital data remains available that allows for more rapid fabrication of a spare



FIGURE 1. AvaDent starter kit.



FIGURE 2. Putty cast created by adaptation to the old maxillary denture.

denture, a replacement denture or even a radiographic or surgical template that aids in the planning and placement of dental implants in the future. Additionally, because the digital data is associated with a specific practitioner, it is more likely that patients will return to the dentist who fabricated their first digital denture when future treatment is needed.

A review of recent literature reveals multiple reports where computer-aided technology was used in the fabrication of complete dentures. The actual process of computer-aided designing has included laser scanning¹ of definitive impressions or previous dentures,² as well as the use of cone beam computerized tomography (CBCT) of modified existing dentures.³ The computer-aided manufacturing process has utilized laser lithography,¹ computer numerical control (CNC) milling techniques,² refined versions of the rapid prototyping technique^{4,5} and state-of-the-art CNC techniques that used five-axis milling.³

Currently, two techniques are being used for the actual fabrication of CAD/CAM dentures. One process (the AvaDent system) uses the subtractive technique of milling a denture base from a prepolymerized "puck" of denture base resin and the other process (the Dentca system) uses an additive technique whereby rapid prototyping (stereolithography) is used to form a trial denture, if requested by the dentist. The definitive denture is processed conventionally.

Reporting the "first proof-ofconcept" for the clinical fabrication and placement of CAD/CAM complete dentures in a patient and describing clinical methods used to acquire the necessary morphological data, Goodacre et al.⁶ predicted, "[W]hen the CAD/CAM technology for fabricating complete dentures becomes commercially available, it will be possible to scan the denture base morphology and tooth positions recorded with this technique and import those data into a virtual tooth arrangement program where teeth can be articulated and then export the data to a milling device for the fabrication of the complete dentures." With the introduction of commercially available CAD/CAM denture systems such as AvaDent and Dentca, the era of digital complete dentures has arrived. The purpose of this article is to describe the procedures associated with the AvaDent and Dentca systems.

AvaDent Technique

The AvaDent digital denture process involves the following two appointments:

1. Impressions, jaw relation records, occlusal plane orientation, tooth mold and shade selection and maxillary anterior tooth positioning record; and

2. Placement of the dentures.

Appointment One

The AvaDent system includes a kit of all the required materials and devices to complete the two-appointment clinical process (FIGURE 1).



FIGURE 3. Selected AvaDent stock tray and maxillary putty cast.

Customizing Stock Trays

The procedure starts with fabrication of a putty cast formed by pressing mixed poly(vinyl siloxane) putty into the intaglio surface of the patient's existing dentures (**FIGURE 2**). If these dentures are unacceptable or unavailable, then diagnostic casts can be generated from a preliminary impression.

FIGURE 3 shows the thermoplastic tray selection for the maxillary arch. The tray is softened by immersing it in a water bath set at 80° C (170° F) for approximately one minute and adapting the tray to the putty cast by pressing the material into contact with the cast or stretching the material to cover required areas. The adapted trays can then be adjusted using acrylic resin burs to remove overextended areas.

After the trays have been adapted on the putty cast, they are placed in the patient's mouth to determine if there are areas of overextension or underextension and adjustments are made as needed. It is important that the maxillary tray extends posteriorly to cover the area of the vibrating line and the pterygomaxillary fissures (hamular notches). It is also important that the mandibular tray cover the retromolar pads, the buccal shelves and available areas of the lateral throat form (retromylohyoid area). Coverage of the appropriate maxillary areas requires determining the location of the vibrating line by having the patient pronounce the word "aah" or by coughing and by palpation of the distal aspect of the




FIGURE 5. Maxillary AMD showing wrench used to move the adjustable lip support flange.



FIGURE 6. Mandibular AMD with tracing plate and maxillary AMD with stylus.

FIGURE 4. Maxillary and mandibular definitive impressions.

tuberosities to locate the pterygomaxillary fissures. Determining the extension of the mandibular tray requires visually locating the retromolar pads and reflecting the cheeks to locate the extent of the buccal shelves. Evaluation of the retromylohyoid areas requires placing the head of a dental mirror into these areas and asking the patient to wet his/her lips with his/ her tongue to determine the degree of displacement of the mirror by the tongue musculature.

Making Maxillary and Mandibular Definitive Impressions

After customizing the impression trays and confirming appropriate coverage and adaptation in the patient's mouth, tissue stops should be added to the trays. After applying the appropriate adhesive, AvaDent registration is applied as four dabs to distributed areas on the maxillary trav and three areas on the mandibular tray. The trays are then seated in the patient's mouth and oriented so the trays are not pressed into contact with the soft tissue, thereby leaving space for the subsequent border molding and light-body wash impression material. The AvaDent border molding impression material is used to border mold the maxillary and mandibular trays employing the method used with conventional custom travs.

The border-molded trays are inspected. If there are areas where the tray has contacted the mucosa, these areas are removed using an acrylic resin bur. If there are defects in the border molding, adhesive is applied to these areas and additional border molding material applied so the border molding can be refined in those areas.

Definitive impressions of the maxillary and mandibular arches are made using the AvaDent light-body poly(vinyl siloxane) impression material (**FIGURE 4**). Because there is no polymerization shrinkage of the denture base, because it is milled from prepolymerized resin, posterior palatal seals are not always needed, unless there is considerable moveable tissue present in the posterior palate and over the edentulous ridges.

When a posterior palatal seal is needed, the area of coverage is identified by marking the vibrating line and the areas located anteriorly where the seal can be positioned based on the areas of compressibility and the depth to which the tissue can be compressed in these areas. These areas are marked and then transferred to the impression. The traditional method of scoring the definitive maxillary cast to establish the posterior palatal seal area is not used with CAD/CAM maxillary dentures because there is no physical cast. Wax can be applied to the areas of the impression where a posterior palatal seal is needed and the wax built to a height that corresponds to the desired depth of the compressible tissue. It is proposed that the height of the wax be one-half or less of the tissue compressibility depth.

Jaw Relation Records

The AvaDent denture technique uses an anatomical measuring device (AMD) that can be adjusted to the desired occlusal vertical dimension (OVD) and then used to maintain that dimension while centric relation is recorded using the incorporated gothic arch tracing plate and stylus. The AMD is also used to determine the correct amount of upper lip support, the position of the maxillary six anterior teeth and the desired mediolateral orientation of the occlusal plane. The AMD consists of a maxillary tray with a centrally located adjustable stylus and an adjustable lip support flange (**FIGURE 5**) and a mandibular tray with a flat occlusal tracing plate (FIGURE 6). In addition, there is an occlusal plane orientation ruler that can be inserted into the maxillary AMD and used to record the alignment of the maxillary AMD with the interpupillary line so that the computer program will be able to align the maxillary teeth with the interpupillary line.

The maxillary AMD is coated with adhesive then covered with AvaDent registration material (FIGURE 7). It is then seated to record the ridge morphology of the maxillary arch as well as the portion of the palate covered by the AMD. There should be sufficient material to stabilize the tray or the process should be repeated.

The mandibular tray with the recording plate is then coated with adhesive and filled with the recording material so it can be seated in the patient's mouth. Care should be taken



FIGURE 7. Maxillary AMD filled with recording material.



FIGURE 8. Maxillary and mandibular AMD placed fairly parallel to each other.



FIGURE 10. Occlusal vertical dimension being adjusted.

FIGURE 11. Gothic arch recording.



FIGURE 9. Evaluating occlusal vertical dimension.



FIGURE 12. Stylus seated in the recess created at the apex of the gothic arch recording.

that the maxillary and mandibular AMDs are positioned so that they are fairly parallel to each other and the maxillary stylus is located over the anterior aspect of the mandibular AMD tracing plate (**FIGURE 8**), or the process should be repeated.

The occlusal vertical dimension is determined. If the existing dentures provide an appropriate occlusal vertical dimension, they can be used to record the distance between marks on the face when the dentures are in occlusal contact. If not, use conventional methods to determine the desired dimension. The rest vertical dimension, speech, tonicity of the musculature, facial proportions and biofeedback can be used to confirm appropriate occlusal vertical dimension (FIGURE 9). The adjustable screw in the maxillary tray is turned clockwise to extend the stylus, or counterclockwise to retract the stylus so it contacts the mandibular tracing plate at the appropriate vertical dimension (FIGURE 10). Once the vertical dimension has been established, the adjustable screw in the maxillary AMD is used to extend or retract the upper lip support flange so it provides appropriate lip support. The patient is given an opportunity to assess the adjustments by viewing his or her lips in a mirror.

Recording centric relation is accomplished by making an intraoral gothic arch recording. While the stylus on the maxillary AMD can produce markings on the mandibular plate when jaw movements are made, it is helpful to place a marking medium on the tracing plate by either rubbing articulating paper over the plate or spraying the plate with an aerosol marking medium. The gothic arch tracing is made by instructing the patient to move his/her lower jaw forward and backward while maintaining contact between the maxillary stylus and the mandibular AMD tracing plate. The patient is then instructed to move his/her jaw to one side, making a lateral excursive movement from the centric relation position, and then to the contralateral side. The stylus on the maxillary tray scribes lines on the mandibular recording plate, and if the process is done correctly, an arrow point or gothic arch recording should be clearly seen (FIGURE 11). The apex of the recording denotes the centric relation position. A recess is then made in the tracing plate that approximates the tip diameter of the stylus at the apex of the gothic arch arrowpoint using an appropriately sized round bur or acrylic resin bur, and the mandibular trav is reinserted in the patient's mouth. The patient can then move his/her mandible or be guided to the position where the maxillary stylus engages the recess so as to maintain the centric relation position (FIGURE 12).

Occlusal Plane Orientation, Maxillary Anterior Mold and Shade Selection and Maxillary Anterior Tooth Positioning

To record the occlusal plane orientation, the AvaDent ruler is inserted in the maxillary AMD (FIGURE 13) and the anterior adjustable portion moved until it is aligned parallel to the imaginary interpupillary line connecting the centers of the pupils of the eyes (FIGURE 14). The angle is noted and recorded on the laboratory work authorization form. This will assist the manufacturer in orienting the mediolateral occlusal plane so it parallels the interpupillary line.

The next procedure in this first appointment is to mark the midline on the lip support flange as well as the smile line for the maxillary anterior teeth based on the curvature of the lower lip during smiling. The size of the maxillary anterior teeth is determined by overlaying the three available tooth size templates on the teeth in the existing denture, assuming the existing denture tooth size is desirable to the patient (FIGURES 15 AND 16). If not, the tooth template is selected that matches the patient's desired tooth size. In addition, by overlaying the maxillary tooth templates on the existing denture, the position of the pink denture base resin around the necks of the teeth can be selected from the three numbered locations present on the tooth template. To serve as a guide during denture fabrication, flowable composite resin is applied to the inside of the selected tooth mold template. The tooth mold template is then positioned carefully over the midline and smile line markings and placed in the exact location where the denture teeth should be arranged. The resin is then light polymerized to affix the template in position (FIGURE 17). The orientation of the template is then assessed during talking and smiling.



FIGURE 13. AvaDent ruler being attached to the maxillary AMD.



FIGURE 14. Determining the appropriate occlusal plane with AvaDent orientation ruler.

FIGURE 16. Determining incisal-cervical length of denture

teeth using old denture as a guide.



FIGURE 15. Teeth selection mold tabs.



FIGURE 17. Luting selected tab with flowable light-cured composite resin.

With the mandible stabilized in its centric relation position by the stylus engaging the recess in the tracing plate, AvaDent registration material is injected into the space between the maxillary and mandibular arches (FIGURE 18). It is important that a generous amount of material be used



FIGURE 18. Injecting recording material to capture centric relation

so it flows around the tracing plate and stylus and firmly attaches the maxillary and mandibular AMD trays together. The interocclusal record assembly is then removed and inspected to confirm that the stylus is in the centric relation recess and that the AMD trays are firmly interlocked



FIGURE 19. Jaw relation record with mold tab.



FIGURE 20. Determining virtually the borders of the maxillary complete denture.



FIGURE 21. Virtual teeth arrangement by AvaDent system.



FIGURE 22. Milled AvaDent denture base.



FIGURE 23. Denture tooth placed in the milled recess.



FIGURE 24. AvaDent wax trial denture.



FIGURE 25. AvaDent resin trial denture (different patient).

(FIGURE 19). After following normal disinfection protocol, the final impressions and connected AMD trays (along with the completed laboratory authorization form) are mailed to Global Dental Science LLC, producer of AvaDent digital dentures, along with any special instructions.



FIGURE 26. Composite resin added to trial denture teeth creating natural appearance and appropriate visibility of anterior teeth on modified side.

FIGURE 27. Definitive AvaDent digital denture fabricated resembling the modified trial denture.

The company processes the impression and the AMD so they can be more easily recorded during the laser scanning process. Laser scans of the complete arch impressions and the connected AMD trays are made and the morphologic data merged so as to establish the occlusal relationship of the arch morphology obtained from the complete arch impressions. The denture borders are identified and marked using the computer software (**FIGURE 20**), teeth are set virtually so they occlude properly and have the desired occlusal plane orientation (**FIGURE 21**) and the morphology of the denture base is



FIGURE 28. Smile view of a patient with AvaDent digital complete dentures.





FIGURE 29. Maxillary and mandibular Dentca detachable stock trays.

FIGURE 30. Maxillary and mandibular definitive impressions.

established. Once the denture has been designed virtually, the denture base is milled with recesses that accurately fit each denture tooth (FIGURES 22 AND 23) and the teeth are bonded in position using a proprietary bonding mechanism. The denture base can be fabricated from different choices of base material and different options are available for the denture teeth.

Trial Placement Options

Clinicians can request a wax trial denture that has a CAD/CAM milled base with the denture teeth set in wax so they can be repositioned as needed (FIGURE 24). Another trial denture option is to request a tooth-colored stereolithographic trial denture that can be modified by reshaping the teeth or adding composite resin to guide in fabrication of the definitive prosthesis (FIGURES 25, 26 AND **27**). This stereolithographic trial denture can also be used for diagnostic purposes to determine if a fixed implant prosthesis (fixed complete denture) will provide adequate lip support or the denture flange support provided by an overdenture is needed. It can also be converted to a surgical template for implant placement.

Appointment Two

Placement

The placement and post placement adjustments of CAD/CAM complete dentures are similar to the placement of conventional dentures. Because the denture base is made from a traditional resin material, implant attachments, if any, as in the patient situation illustrated, can be picked up intraorally using conventional techniques. **FIGURE 28** shows the frontal smile view of a patient wearing a maxillary complete denture and a mandibular implant overdenture fabricated by the AvaDent digital denture system. The patient is seen as needed for routine follow-up and maintenance appointments.

Dentca Technique Appointment One

The Dentca system provides a starter kit as well that includes a small, medium, large and extra large set of stock trays in addition to a lip ruler.

Customizing Stock Trays

Both maxillary and mandibular Dentca stock trays are two-piece trays with detachable posterior segments (FIGURE 29). The appropriately sized maxillary and mandibular stock trays are selected based on the patient's arch size. The Dentca trays are used for both the definitive impression and also for the jaw relation records by sectioning the complete arch impression, removing the posterior segments and then attaching a gothic arch device.

The chosen trays are placed in the patient's mouth to evaluate them for areas of overextension or underextension and adjustments are made as needed.

Making Maxillary and Mandibular Definitive Impressions

The trays are painted with an adhesive and a heavy-body poly(vinyl siloxane) impression material used for the border molding. Definitive impressions of the maxillary and mandibular arches are made using a light-body poly(vinyl siloxane) impression material (FIGURE 30). The area of the posterior palatal seal is identified, marked and then transferred to the impression in the conventional manner.

Jaw Relation Records

In preparation for the jaw relation records, a No. 15 surgical blade is used to slice through the poly(vinyl siloxane) impression material on both the maxillary





FIGURE 32. Separated maxillary and mandibular impressions.



the impression.

FIGURE 33. Adjustable stylus being slotted into the mandibular tray.



FIGURE 34. Dentca impressions with the recording assembly at the appropriate OVD.

and mandibular impression so as to produce a single incision line to detach the posterior part(s) from the anterior part(s) (**FIGURE 31**). Care should be taken during the separation of the parts to avoid breakage or distortion of the trays. Careful and intermittent wiggling and pulling motions are recommended to achieve appropriate separation (**FIGURE 32**).

Excess impression material covering the occlusal surface of the maxillary tray is carefully removed to reveal the flat occlusal tracing plate that is incorporated into the maxillary tray. An adjustable stylus is carefully inserted into slots located in the lingual surface of the mandibular tray (**FIGURE 33**). A clear clicking sound is heard when the stylus assembly is correctly positioned.

The anterior parts of the maxillary and mandibular impressions are then inserted in the patient's mouth and confirmation made that the trays are stable prior to any record making. The occlusal vertical dimension is determined in the usual manner and adjustments are made to the mandibular stylus as needed. If the existing dentures provide an appropriate occlusal vertical dimension, they can be used to record the distance between selected marks (points) on the face when the dentures are in occlusal contact. When finalizing the occlusal vertical dimension, the mandibular stylus should contact the maxillary tracing plate (**FIGURE 34**).

Recording centric relation is accomplished by making an intraoral gothic arch tracing by having the mandibular stylus scribe lines on the maxillary tracing plate. Because the maxillary plate is very smooth and highly polished, the mandibular stylus might not produce clear markings on the maxillary plate when jaw movements are made. Therefore, it may be necessary to place a marking medium on the tracing plate by spraying the plate with an aerosol marking medium or rubbing articulating paper over the surface and transferring the pigment from the paper to the plate. The gothic arch tracing is made in the usual manner.

A recess is then made in the maxillary tracing plate at the apex of the gothic arch arrowpoint that approximates the tip



FIGURE 35. Dentca jaw relation record.

diameter of the stylus. An appropriately sized round bur or acrylic resin bur is used to create the recess and then both trays are reseated in the patient's mouth.

An interocclusal registration record material is injected in the space between the maxillary and mandibular trays while ensuring that the jaws are stabilized in the centric relation previously registered (FIGURE 35). After the material has set, the interocclusal record assembly is removed from the mouth and evaluated to confirm that the stylus is positioned in the centric relation recess and that the trays are adequately locked together.

A lip ruler is provided in the kit to measure the length of the maxillary lip. A measurement is made between the incisive papilla and the inferior border of the upper lip (FIGURE 36). The trays are then disinfected and mailed along with a laboratory work authorization form to the manufacturer. Dentca offers two types of dentures: standard and premium. The premium denture is meant as an upgrade with characterized denture base, gingival





FIGURE 37. Virtual maxillary and mandibular edentulous ridges and teeth arrangement by Dentca system.

FIGURE 36. Ruler used to measure length of upper lip.



FIGURE 38. Maxillary and mandibular Dentca stereolithographic trial dentures.

toning, anatomical palatal cameo surface and Candulor Physio Star NFC anterior teeth and Condyloform posterior teeth (Candulor USA Inc., Los Angeles).

The definitive impressions and the centric relation record are scanned to produce maxillary and mandibular virtual edentulous ridges using special computer software (FIGURE 37). The provided lip length is also introduced into the software. Denture teeth are then set virtually so they occlude properly and have the desired occlusal plane orientation (FIGURE 37).

Once the dentures have been designed virtually, the data is transferred to a 3-D laser lithography machine that fabricates trial dentures using a rapid prototyping process (**FIGURE 38**). The stereolithographic trial dentures are provided as part of the fabrication fee, if requested by the clinician. However, this process adds an additional appointment. The stereolithographic trial dentures can also serve as surgical templates for implant placement. A conventional processing technique is used to fabricate the definitive dentures.



FIGURE 39. Smile view of a patient with Dentca CAD/CAM complete dentures.

Appointment Two

Placement

The placement and post-placement adjustments of CAD/CAM complete dentures are similar to the placement of conventional dentures. **FIGURE 39** shows the frontal smile view of a patient wearing maxillary and mandibular complete dentures fabricated by the Dentca CAD/CAM system.

Discussion

Based on clinical experience with the CAD/CAM fabrication of complete dentures, the authors believe the advantages gained through use of this technology will cause the process to continually gain traction as an alternative to conventionally processed complete dentures.

Previous publications describing CAD/ CAM fabrication of complete dentures were initial reports offering proof of concept and did not include clinical assessment. However, one publication by Inokoshi et al.5 compared a complete denture trial placement method using a rapid prototyping protocol to conventional wax trial dentures and reported favorable or higher ratings regarding esthetics and stability for the wax trial dentures. Because there is a lack of data, it is cautioned that, for objective comparison of CAD/CAM complete dentures with conventionally fabricated dentures, research is needed to obtain evidence-based/scientific assessment of this new concept.

Because CAD/CAM techniques rely on the use of gothic arch tracings to record jaw relationships, there is concern that it might be beyond the scope of an inexperienced dentist, as this technique is not routinely taught in dental schools. Future research will be needed to validate or reject this hypothesis. Also, a gothic arch tracing is not readily achieved in certain clinical situations such as those with severe skeletal discrepancies, resorption and patients with ataxia of the mandible. Hence, utilization of a classification system such as the prosthodontic diagnostic index developed by the American College of Prosthodontists⁷ might be beneficial in early and appropriate determination of technique for different clinical situations.

The purpose of this article is not to endorse any product but to provide information on the technology available regarding a potential paradigm shift in the method of fabrication of complete dentures.

Conclusion

The use of CAD/CAM technology to fabricate complete dentures has positive benefits for both the patient and practitioner. Because the required clinical records can be obtained in one appointment



Ed Cahill, JD

800.641.4179

wps@succeed.net adstransitions.com westernpracticesales.com and the dentures completed for a second appointment, there is less clinical time involved in the treatment. Therefore, it should be possible to reduce the cost of care for patients while still providing quality dentures using state-of-the-art dental materials. Elimination of the polymerization shrinkage inherent in conventionally processed complete dentures enhances the fit of the denture base. Additionally, having a repository of digital data allows for rapid fabrication of spare or replacement dentures.

There are two commercially available CAD/CAM systems, AvaDent and Dentca, with the AvaDent system being the only one that does not use conventional processing of the denture base resin.

As we transition to the world of CAD/ CAM dentures, competency in, making acceptable impressions, determining the appropriate OVD, capturing accurate records, applying esthetic principles and intervention for behavioral modification when required will continue to play a predominant role, even as the applications for this new technology continue to expand.

REFERENCES

 Maeda Y, Minoura M, Tsutsumi S, Okada M, Nokubi T. A CAD/ CAM system for removable denture.Part I: Fabrication of complete dentures. *Int J Prosthodont* 1994;7:17-21.
Kawahata N, Ono H, Nishi Y, Hamano T, Nagaoka E. Trial of duplication procedure for complete dentures by CAD/CAM. *J Oral Rehabil* 1997;24:540-8.

3. Kanazawa M, Inokoshi M, Minakuchi S, Ohbayashi N. Trial of a CAD/CAM system for fabricating complete dentures. *Dent Mater J* 2011;30:93-6.

 Sun Y, Lü P, Wang Y. Study on CAD&RP for removable complete denture. Comput Methods Programs Biomed 2009;93:266-72.
Inokoshi M, Kanazawa M, Minakuchi S. Evaluation of a complete denture trial method applying rapid prototyping. Dent Mater J 2012;31:40-6.

6. Goodacre CJ, Garbacea A, Naylor WP, Daher T, Marchack CB, Lowry J. CAD/CAM fabricated complete dentures: concepts and clinical methods of obtaining required morphological data. J Prosthet Dent 2012;107:34-46.

7. McGarry TJ, Nimmo A, Skiba JF, Ahlstrom RH, Smith CR, Koumjian JH Classification system for complete edentulism. The American College of Prosthodontics. *J Prosthodont* 1999 Mar;8(1):27-39.

 $\label{eq:theta} \textbf{THE CORRESPONDING AUTHOR, } Mathew T. Kattadiyil, DDS, MDS, MS, can be reached at mkattadiyil@llu.edu.$



Management of Antithrombotic Therapy Before Full-mouth Extraction

R. ANDREW POWLESS, DMD; HESHAM R. OMAR, MD; DEVANAND MANGAR, MD; AND ENRICO M. CAMPORESI, MD

ABSTRACT The management of antiplatelet and anticoagulant therapy before fullmouth extraction is a major concern for dentists. Approach should vary depending on the risk of bleeding and adverse cardiac events. We have adapted a more conservative approach with continuation of antiplatelet therapy in the majority of patients while implementing local hemostatic measures with good outcomes. Specific recommendations are provided for antiplatelet therapy before mouth extraction.

AUTHORS

R. Andrew Powless, рмр, is vice chief of Dental and Oral and Maxillofacial Surgery at Tampa General Hospital, a large tertiary hospital in Tampa, Fla. Conflict of Interest Disclosure: None reported.

Hesham R. Omar, MD, is an internal medicine resident at Mercy Hospital and Medical Center in Chicago. He is interested in the field of clinical cardiology and perioperative medicine. *Conflict of Interest Disclosure: None reported.*

Devanand Mangar, мр,

is a board-certified anesthesiologist and is the president and CEO of Florida Gulf-to-Bay Anesthesiology in Tampa, Fla. Conflict of Interest Disclosure: None reported.

Enrico M. Camporesi, мо, a board-certified

anesthesiologist, is professor emeritus of Surgery/Anesthesiology and professor of Molecular Pharmacology and Physiology at the University of South Florida in Tampa, Fla. Conflict of Interest Disclosure: None reported. ental surgeons occasionally encounter a patient who requires full-mouth extraction and who is on antiplatelet or anticoagulant

medications. The decision of whether to continue therapy to avoid cardiac events, or hold it in favor of reducing blood loss, is challenging. These recommendations are usually given by primary care physicians, dentists, other health care providers or, at times, by the patient's direct initiative. A referral to a cardiologist for guidance through this dilemma is sometimes not done. Preoperative discontinuation of antiplatelets to decrease bleeding complications can trigger a rebound rise in platelet activation and aggregation thereby increasing the risk of stent thrombosis.¹⁻³ Moreover, prolonged bleeding can be controlled with local hemostatic measures.⁴⁻⁶ The consequences of bleeding are usually outweighed by the hazards of stopping or reducing antithrombotic therapy. Therefore, any decision to alter these medications preoperatively should be considered collaboratively with the cardiologist and on a case-by-case basis depending on the risk/benefit, dentist skills and difficulty of the procedure, while adhering to the current practice guidelines. Herein, we review the recommendations pertaining to the care of patients receiving full-mouth extractions who are on antiplatelet and anticoagulant therapy.

Anticoagulant Therapy

Primary care dental practices tend to routinely discontinue warfarin prior to dental surgery to minimize bleeding risk. Studies comparing blood loss among anticoagulated and nonanticoagulated patients showed no increase in bleeding.⁷⁻¹⁰ Bridging therapy with low molecular weight heparin (LMWH) was not superior to continuing oral anticoagulation in reducing postoperative bleeding.¹¹ Furthermore, in a systematic review, withdrawing warfarin prior to dental procedures increased the risk of thromboembolic events (out of 493 patients, five developed a serious thromboembolic complication, resulting in four deaths).¹² It should also be noted that not all patients on anticoagulant therapy have an equal risk of thromboembolism. For example, patients with a mechanical mitral valve, ball-and-cage valve, venous thrombosis within the previous three months, hypercoagulable state or atrial fibrillation with a history of stroke are considered a high-risk group¹³ where anticoagulant withdrawal is unfavorable. The skills of the operating dentist and the complexity of the surgery should also be taken into consideration especially as the international normalized ratio (INR)* approaches 4. Minor dental procedures can be completed with minimal bleeding when the INR is <4. Some authors suggest a more conservative approach for full-mouth extraction with an INR <3,¹⁴ which we agree with.

Antiplatelet Therapy

Antiplatelet therapy is utilized to decrease cardiovascular and cerebrovascular complications in atrisk patients. Because of advances in percutaneous coronary intervention (PCI) technology with the development of drug eluting stents (DES) and the evolution of dual antiplatelet therapy (DAPT), the number of patients on these medicines is increasing dramatically. The American College of Cardiology (ACC)/American Heart Association

ALTHOUGH SELDOM necessary, it is better to accept the minor risk of transfusion than to face the hazards of perioperative cardiac events after discontinuing antiplatelets.

(AHA) guidelines recommend at least 12 months of DAPT after DES and one month after bare metal stent (BMS) deployment to avoid stent thrombosis¹⁵ and hence delaying any surgery whenever possible in this time frame. However, the delayed endothelialization with DES has contributed to the increased risk of late and very-late stent thrombosis.¹⁶ Cessation of DAPT is the single most significant predictor of stent thrombosis.^{17,18} Therefore, after the recommended time frame for DAPT in patients with recent PCI with DES, discontinuation of antithrombotic medication should still be at the discretion of the cardiologist.

Lillis et al.¹⁹ studied 643 patients undergoing three or fewer dental extractions during uninterrupted single or DAPT and found no significant difference in bleeding in the control and single antiplatelet therapy group with either aspirin or clopidogrel alone. However, prolonged bleeding was higher in patients on DAPT (P < 0.001), which occurred in 66.7 percent of these patients, but they were successfully treated with local hemostatic measures. Recently, Park et al.²⁰ completed a study on 100 matched pairs of patients with DES undergoing one to six teeth extractions while on antiplatelet therapy. Excessive bleeding was found in two cases in the continued drug therapy group and one case in the control group. Interestingly, all underwent three or fewer extractions and none required transfusion.

Unfortunately, no specific advice is given for patients undergoing major dental procedures on DAPT.²¹ It becomes obvious that in performing full-mouth dental extractions on DAPT, completion of the work in sequential surgical stages would be the preferred plan. However, this could take numerous visits, and if combined with the need for anesthesia, could be impractical. In our experience with dental patients undergoing full-mouth extractions and other extensive oral surgeries in-hospital while on DAPT, transfusion of blood products is rarely required because of good surgical technique and implementation of local hemostatic measures. In instances where the expected risk of bleeding is high, we routinely type and cross the patient for possible transfusion. Although seldom necessary, it is better to accept the minor risk of transfusion than to face the hazards of perioperative cardiac events after discontinuing antiplatelets. In instances where there is consideration for excess bleeding and in low-risk cardiac patients, a referral to the cardiologist is important to decide whether or not to hold antiplatelet medications. When deciding on holding one agent in patients on DAPT, clopidogrel is discontinued five days prior

^{*}An international normalized ratio test measures the time it takes for blood to clot and compares it to an average. In healthy people, the INR is about 1.0. For patients on anticoagulants, the INR should be between 2.0 and 3.0 for patients with atrial fibrillation, or between 3.0 and 4.0 for patient with mechanical heart valves. Taken from hrsonline.org.

to the procedure while continuing aspirin therapy. In this occasion, clopidogrel is resumed postoperatively with an initial higher loading dose (300 mg) for rapid achievement of optimal blood levels. In high-risk cardiac patients where DAPT is mandatory and surgery could not be delayed, DAPT is continued. Due to their short half-life, glycoprotein IIb/ IIIa antagonists (e.g., eptifibatide) have been utilized to bridge thienopyridine therapy (e.g., clopidogrel) before coronary artery bypass grafting (CABG)²² and other surgeries, however, no studies were performed on dental patients. Future trials might be important for patients requiring extensive oral surgeries with increased bleeding risk on DAPT after recent PCI.

NSAIDs Prior to Dental Procedures

Dental patients usually receive NSAIDs for pain control. These drugs prevent the formation of thromboxane A2, which stimulates platelet aggregation.²³ Moreover, the use of NSAIDs in patients on warfarin is associated with increased risk of over-anticoagulation and bleeding. Prasad et al. and Braganza et al. concluded a significantly higher blood loss and a prolonged bleeding time during periodontal surgery in patients who received ibuprofen.^{24,25} It is therefore preferable to discontinue NSAIDs when tolerable if the expected risk of bleeding is significant, especially in patients on warfarin.

The management of antiplatelet and anticoagulant therapy before full-mouth extraction is a major concern for dentists. Approach should vary depending on the case, taking into account the risk of bleeding together with the benefit of cardiac protection. At our institution, we have adapted a more conservative approach with continuation of antiplatelet therapy in the majority of patients while implementing local hemostatic measures with good outcomes. We propose the following recommendations:

- In patients with prior PCI or cardiac disease, consulting the patient's cardiologist is mandatory whenever the dentist requests cessation of aspirin or clopidogrel.
- In patients with DES deployment (<1 year) or BMS deployment (<1 month), delay of elective surgery whenever possible is recommended. If surgery can't be delayed then continuing perioperative DAPT is crucial to avoid the risk of stent thrombosis.
- In patients with DES deployment (>1 year) or BMS deployment (>1 month) on DAPT, we recommend continuing them perioperatively. This is especially important in patients with DES due to delayed endothelialization of stent struts and the potential for very late stent thrombosis.
- Implementing local hemostatic measures, e.g., Gelfoam, Sugicel, Colla-plug, 5 percent tranexamic acid mouthwash and employing figureeight suturing to minimize blood loss and transfusion requirements.
- Preparing patients on DAPT or warfarin with high risk of bleeding for postoperative transfusion. Ensuring the availability of packed red blood cells and fresh frozen plasma is recommended should uncontrolled bleeding occur.
- In cases of full-mouth extractions in patients with high bleeding risk, consider serial surgical appointments with local anesthesia to remove two to three teeth at a time.
- In instances where the cardiac risk is low and the bleeding risk is high, and in patients without prior DES deployment, consider stopping antiplatelet therapy for those on monotherapy, and clopidogrel five days prior to surgery for those on dual

therapy (while continuing aspirin) after consulting the patient's cardiologist.

- In patients with high bleeding risk, consider discontinuing NSAIDs prior to surgery if deemed tolerable.
- In case of preoperative cessation of antiplatelets, return to full coverage within hours after extraction. A higher loading dose can be initiated for faster achievement of adequate plasma level, e.g., 300 mg of clopidogrel.
- In patients on warfarin therapy anticipating full-mouth extraction, INR should be performed on the day of surgery. Preferably the target INR should be less than 3.

REFERENCES

 Collet JP, Montalescot G, Blanchet B, Tanguy ML, Golmard JL, Choussat R, et al. Impact of prior use or recent withdrawal of oral antiplatelet agents on acute coronary syndromes. *Circulation* 2004;110(16):2361-7.

 Perrari E, Benhamou M, Cerboni P, Marcel B. Coronary syndromes following aspirin withdrawal: a special risk for late stent thrombosis. *J Am Coll Cardiol* 2005;45(3):456-9.
Beving H, Zhao C, Albage A, Ivert T. Abnormally high platelet activity after discontinuation of acetylsalicylic acid treatment. *Blood Coagul Fibrinolysis* 1996;7(1):80-4.

4. American Dental Association. Anticoagulant, Antiplatelet Medications and Dental Procedures. Professional Resources, Oral Health Topics. ada.org/2526.aspx. Accessed Aug. 14, 2012. 5. Aframian DJ, Lalla RV, Peterson DE. Management of dental patients taking common hemostasis-altering medications. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2007; Suppl 1):545,e1-11.

6. Aldridge E, Cunningham Jr LL. Current Thoughts on Treatment of Patients Receiving Anticoagulation Therapy. J Oral Maxillofac Surg 68:28792887, 2010.

 Devani P, Lavery KM, Howell CJ. Dental extractions in patients on warfarin: is alteration of anticoagulant regime necessary? *Br J Oral Maxillofac Surg* 1998; 36:107–11.
Campbell JH, Alvarado F, Murray R. Anticoagulation and minor oral surgery: should the anticoagulation regimen be altered? *J Oral Maxillofac Surg* 2000; 58:131–5.
Evans IL, Sayers MS, Gibbons AJ, Price G, Snooks H, Sugar AW. Can warfarin be continued during dental extraction? Results of a randomized controlled trial. *Br J Oral Maxillofac Surg* 2002: 40: 248–52.

 Zanon E, Martinelli F, Bacci C, Cordioli G, Girolami A. Safety of dental extraction among consecutive patients on oral anticoagulant treatment managed using a specific dental management protocol. *Blood Coagul Fibrinolysis* 2003;14:27–30.
Bajkin B, Popovic S, Selakovic SD. Randomized, prospective trial comparing bridging therapy using low molecular weight heparin with maintenance of oral anticoagulation during extraction of teeth. J Oral Maxillofac Surg 67:990, 2009. TIMOTHY G. GIROUX DDS/BROKER

ASK THE BROKER

For every ACTION there is an equal and opposite REACTION

This is Newton's third law of physics and is an appropriate law in dental transactions. Both buyers and sellers need to consider this law in their actions during a transition. Recently I was involved in a "perfect" transaction. It was a small practice with a female dentist who had practically raised her kids in the dental office - selling to a younger female dentist with younger children.

The doctors were getting along splendidly and everyone was happy!

Contracts went out and the buyer chose a well-known dental attorney who made a fair amount of changes to the documents, albeit most of them fairly minor, but a few that needed a little push back. In my lectures, I always advise the buyer to pick a known dental attorney as they understand the issues and can "cut to the chase" quickly. However, I also advise them to control their advisors and encourage them to "own" the changes suggested. (Hopefully keeping revisions to a minimum on critical matters only) Once the ACTION of "firing shots across the bow" begins, one should expect the shots to be returned. That definitely happened here, creating some sore feelings and added expense to the transaction. It was all eventually resolved nicely, but in my humble opinion, much of this might have been avoided with less "red ink" at the beginning. It can be a tough call sometimes as there are ALWAYS reasons to justify the changes. However, no matter which side may feel justified to begin the "volley", both sides should understand the costs involved and possible ramifications of over negotiating small issues that may never occur and may cost less to fix later than negotiate now.

Once the sides start to "volley", issues that never were issues become new points of negotiation in an effort for each side to score points.

Once you hear phrases like "it's the principle of the thing", or "what if" referring to a one-in- a-thousand event, it is time to pull back and assess the REAL magnitude of the issue in question. I have seen an accounts receivable issue that might have resulted in perhaps a \$1000 expense be argued by the attorneys for hours. (Do the math on two attorneys arguing for 3 hours each at \$300+ per hour!)

This process can start from either doctor or either attorney. Of course there are instances where the objections are absolutely justified, but the attitude that "it can't hurt to ask" is not necessarily true! There are many times in the process where one side feels they have made the concessions and it is due for the other side to make the next concession. Just understand both sides should pick your battles and **"KEEP THE BIG PICTURE IN VIEW AT ALL TIMES!"**

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

12. Wahl MJ. Dental surgery in anticoagulated patients. Arch Intern Med 1998; 158: 1610-6.

13. Beirne OR. Evidence to continue oral anticoagulant therapy for ambulatory oral surgery. *J Oral Maxillofac Surg* 2005; 63: 540-5.

14. Dodson TB. No need to routinely discontinue anticoagulants before dental extractions. *Evidence-based Dentistry* 2002, 3: 100-101.

15. King SB 3rd, Smith SC Jr., Hirshfeld JW Jr., Jacobs AK, Morrison DA, Williams DO, Feldman TE, Kern MJ, O'Neill WW, Schaff HV, Whitlow PL; ACC/AHA/SCAI, Adams CD, Anderson JL, Buller CE, Creager MA, Ettinger SM, Halperin JL, Hunt SA, Krumholz HM, Kushner FG, Lytle BW, Nishimura R, Page RL, Riegel B, Tarkington LG, Yancy CW. 2007 focused update of the ACC/AHA/SCAI 2005 guideline update for percutaneous coronary intervention: a report of the American College of Cardiology/American Heart Association Task Force on Practice guidelines. J Am Coll Cardiol. 2008 Jan 15;51(2):172-209.

16. Omar HR, Mangar D, Karlnoski R, Abdelmalak HD, Camporesi EM. Simultaneous left anterior descending and right coronary stent thrombosis after aspirin withdrawal. *Am J Emerg Med* 2012 Nov;30(9):2093.e5-8.

17. lakovou I, Schmidt T, Bonizzoni E, Ge L, Sangiorgi GM, Stankovic G, Airoldi F, Chieffo A, Montorfano M, Carlino M, Michev I, Corvaja N, Briguori C, Gerckens U, Grube E, Colombo A. Incidence, predictors and outcome of thrombosis after successful implantation of drug-eluting stents. JAMA 2005 May 4;293(17):2126-30.

 Park DW, Park SW, Park KH, Lee BK, Kim YH, Lee CW, Hong MK, Kim JJ, Park SJ. Frequency of and risk factors for stent thrombosis after drug-eluting stent implantation during longterm follow-up. Am J Cardiol 2006 Aug 1;98(3):352-6.
Lillis T, Ziakas A, Koskinas K, et al. Safety of Dental Extractions During Uninterrupted Single or Dual Antiplatelet Treatment. Am J Cardiol 2011;108:964-967.

20. Park MW, Her SH, Kwon JB, et al. Safety of Dental Extractions in Coronary Drug-eluting Stenting Patients Without Stopping Multiple Antiplatelet Agents. *Clin Cardiol* 35, 4, 225-230 2012.

 Diermen DEv, Aartman IHA, Baart JA, et al. Dental management of patients using antithrombotic drugs: critical appraisal of existing guidelines. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2009; 107:616-624.
Angiolillo DJ, Firstenberg MS, Price MJ, et al. Bridging Antiplatelet Therapy With Cangrelor in Patients Undergoing Cardiac Surgery. A Randomized Controlled Trial. *JAMA* 2012;307(3):265-274. doi:10.1001/jama.2011.2002.
Insel PA. Analgesic-antipyretic and anti-inflammatory agents and drugs employed in the treatment of gout. In: Hardman JG, Limbird LE, Molinoff PB, Ruddon RW, Gilman AG, editors. The pharmacological basis of therapeutics. 9th ed. McGraw-Hill:USA; 1996. P. 623.

24. Shiva Prasad BM, Vijaya M, Reddy SB, Patil SR, Kalburgi NB. The effect of ibuprofen during periodontal surgery. *Indian J Dent Res* 2008 Jan-Mar;19(1):22-5.

25. Braganza A, Bissada N, Hatch C, Ficara A. The effect of nonsteroidal anti-inflammatory drugs on bleeding during periodontal surgery. J Periodontol 2005 Jul;76(7):1154-60.

THE CORRESPONDING AUTHOR, Enrico M. Camporesi, MD, can be reached at ecampore@health.usf.edu.



Meth Mouth Severity in Response to Drug-use Patterns and Dental Access in Methamphetamine Users

RONNI E. BROWN, DDS, MPH; DONALD E. MORISKY, SCD, MSPH, SCM; AND STEVEN J. SILVERSTEIN, DMD, MPH

ABSTRACT Meth mouth is the rapid development of tooth decay in methamphetamine users. Our study questioned whether drug-use patterns and dental care access are risk factors affecting the severity of meth mouth. Participants received dental examinations, and the number of decayed, missing and filled teeth (DMFT) were counted and used to measure meth mouth severity.

AUTHORS

Ronni E. Brown, dds, mph,

is a dentist with California Forensic Medical Group in Santa Rosa, Calif., and was a dental public health resident at the University of California, San Francisco, School of Dentistry. Conflict of Interest Disclosure: None reported.

Donald E. Morisky, scd,

MSPH, SCM, is a professor and director of Doctoral Training in the Social and Behavioral Determinants of the HIV/AIDS Prevention Program at the University of California, Los Angeles, School of Public Health. Conflict of Interest Disclosure: None reported. Steven J. Silverstein, DMD, MPH, is professor emeritus and program director of the Dental Public Health Residency Program at the University of California, San Francisco, School of Dentistry. Conflict of Interest Disclosure: None reported.

ACKNOWLEDGEMENTS

This study was supported by a HRSA Training Grant D5GHP16075. We express our appreciation to the following individuals for their help on this project: Kathleen Kline; Vicki Llaverias, RDA; Katie McGovern, PhD; Bonnie Pollack, PhD; Howard Pollick, BDS, MPH; Linda Suvoy; George Taylor, DMD, DrPH; and Mimi Zeiger, MA.

eth mouth, the rapid development of tooth decay in methamphetamine users, is one of the most visible, painful, embarrassing

and devastating consequences of methamphetamine use. The unusual appearance and rapid development of tooth decay among users of methamphetamine, a potent, illegal and highly addictive central nervous system stimulant, ¹ are not seen with other illegal drugs. The decay appears primarily on the buccal and interproximal surfaces of teeth² and the decayed teeth have been described as "blackened, stained, rotting, crumbling or falling apart."3 However, users experience varying degrees of meth mouth severity, ranging from dentitions with no history of decay to dentitions decimated by decay.⁴ Yet, the risk factors that influence the varying degrees of meth mouth severity have not been fully identified or examined.

The known risk factors for meth mouth include the drug's chemical composition and pharmacologic effects, as well as users' diet and oral hygiene. The chemical composition of methamphetamine, which is manufactured from a variety of ingredients including anhydrous ammonia (found in fertilizers), red phosphorus (found on matchboxes), lithium (found in batteries) and pseudoephedrine (found in cold medications),⁵ is highly acidic and corrosive. This acidity lowers the pH of the oral environment and likely promotes enamel demineralization and tooth decay.³ The pharmacologic effect of methamphetamine, believed to be involved in the development of meth mouth, is the release of dopamine,⁶ the primary neurotransmitter in the brain's reward pathway.⁶ Dopamine is associated

with pleasure, increased self-esteem, increased confidence and heightened sexual experiences,⁷ positive effects that increase the drug's appeal. However, the release of dopamine has significant negative effects including decreased salivary flow,^{8,9} increased bruxism¹⁰ and increased sugar consumption,¹¹ which are known risk factors for tooth decay. Decreased salivary flow is supported by the report of dry mouth by users.¹² Additionally, users' resting salivary pH is significantly lower than nonusers.⁴ Decreased salivary flow and increased salivary acidity are known risk factors for tooth decay.^{13,14} The release of dopamine has been linked to bruxism,¹⁰ a parafunctional habit that increases the risk for root surface exposure and root decay.¹⁵ Users report sugar cravings and binges because sugar consumption mimics the pharmacologic and behavioral effects of methamphetamine, both of which release dopamine.^{11,16} Users' frequent sugar consumption coupled with infrequent oral hygiene,^{2,17,18} and more generalized plaque and calculus than nonusers,^{4,19} further increases their risk for tooth decay. Consequently, users have more decaved teeth than nonusers.¹⁹

However, there are several risk factors associated with meth mouth severity, such as drug-use patterns, that are unknown. Intravenous methamphetamine users have more missing teeth and cosmetic dental problems than methamphetamine smokers.²⁰ Nevertheless, it is not known what effect, if any, other drug-use patterns — duration, frequency, dosage, route of use and co-abuse with alcohol have on meth mouth severity. It seems intuitive, though not yet determined, that the severity of meth mouth would operate as a dose-response relationship. If so, then long-term exposures to methamphetamine at high doses and frequency would increase the number of teeth affected by decay and increase meth mouth severity, compared to short-term, low-dose and infrequent exposures. It further seems intuitive that repeated oral exposures of acidic methamphetamine, which occurs with smoking, would increase the severity of meth mouth compared to repeated non-oral exposures to the drug that occurs with intravenous or intranasal use.

INTRAVENOUS methamphetamine users have more missing teeth and cosmetic dental problems than methamphetamine smokers.

Of further interest is whether alcohol use in conjunction with methamphetamine use is a risk factor affecting meth mouth severity. Co-abusers of drugs and alcohol have more decayed teeth than alcohol-only abusers possibly because of more frequent episodes of dry mouth, poor oral hygiene and high sugar consumption.²¹ A significant percentage of users report co-abuse with alcohol²² and the impact of this co-abuse on meth mouth severity is currently unknown.

In addition, it is unknown what role, if any, access to dental care has on meth mouth severity. Drug addiction negatively impacts employment and insurance status, factors limiting financial access to dental care. It is likely that limited dental care access alters the decay history of users by increasing the number of teeth that remain decayed (untreated) and decreasing the number of teeth that are extracted and/or filled (treated). Limited access to dental care may play a pivotal role in the progression and subsequent severity of meth mouth.

The purpose of this study was to determine whether drug-use patterns and dental care access impact the severity of meth mouth. For this purpose we assessed the effects of duration, frequency and dosage of methamphetamine, and route of use, alcohol co-abuse and dental insurance status on the number of all teeth, both untreated and treated, that were affected by tooth decay in a sample of users using a standardized decay index.

Methods

The institutional review board at the University of California, San Francisco, approved this cross-sectional study (IRB # 11-08046).

Participants

We recruited inmates, 18 years of age and older, from the Sonoma County Sheriff's Department Detention Facilities in Santa Rosa, Calif., who presented to the jail dental clinic for dental screenings and for treatment of emergency and nonemergency dental conditions. Each potential participant completed a health history questionnaire, which included the question: "Do you have a history of drug abuse? If yes, what type (alcohol, methamphetamine, marijuana, cocaine, heroin, other)?" Participants were eligible if they denied use of any drug (nonuser group), denied use of methamphetamine but reported use of other drugs except heroin (nonuser group) or reported use of methamphetamine alone or in combination with other drugs except heroin (methamphetamine user group). Heroin users were excluded because they report increased dental problems with co-abuse of methamphetamine.²³ Participants were also excluded if they were mentally or behaviorally incompetent, non-English speaking or required administrative supervision. A six-digit code, known only to the investigator and dental assistant, was assigned to identify each participant for the purpose of this study and to maintain confidentiality. A total of 99 inmates (72.8 percent), from a sample of 136 eligible inmates, volunteered to participate in this study and provided written informed consent.

Study Design

All participants completed a selfadministered questionnaire. They also received visual dental examinations from the principal investigator, a licensed dentist, in the jail dental clinic. The questionnaire identified and quantified the independent variables of sociodemographics, dental care access and drug-use patterns and was used to maintain participants' confidentiality. The sociodemographic characteristics of interest were participants' gender, age, ethnicity, education, employment, homeownership status and alcohol use. The dental care access characteristics of interest were participants' dental insurance status, length of time since their last dental visit, reason for their last dental visit and their primary location of dental care. The drug-use patterns investigated were duration of methamphetamine use (measured in years), frequency of use (measured per day, week or month), dosages (ranging from less than one-fourth gram to more than one-half gram per use), route of use (oral or non-oral) and co-abuse of methamphetamine and

alcohol. Smoking methamphetamine was categorized as an oral route of use and intravenous and intranasal administration were categorized as nonoral routes of use. The impact of these independent variables on the decay history of participants, the dependent variable, was measured using the DMFT index.^{24,25} The decay history was defined by the number of all permanent teeth, excluding third molars, with a current or past history of decay (decayed, missing or filled), identified visually with a

THE PURPOSE OF this study was to determine whether drug-use patterns and dental care access impact the severity of meth mouth.

mouth mirror. Teeth were counted as decayed when there were visible cavities, missing when the patient recalled an extraction due to decay and filled when there were restorations with no visible decay at the marginal interface. For each participant, the DMFT score could range from o to 28 affected teeth. For users, the decay history was used to quantify meth mouth severity.

Statistical Analysis

Statistical analysis was performed with Statistical Package for Social Sciences (SPSS), version 17.0 (Chicago), with significance set at an alpha level (α) of 0.05. We calculated descriptive statistics (frequencies, crosstabulations and chi-squares) for the patientrelated variables. Independent t-tests (bivariate) were used to compare mean DMFT scores between users and nonusers. Independent t-tests and analysis of variance were used to compare the effect of drug-use patterns and dental care access on mean DMFT scores among users.

A series of multiple linear regression analyses were performed to determine which independent variables were predictors for the dependent variable, DMFT scores. We tested the hypothesis that route of use, specifically oral (smoking), is a more significant predictor of DMFT scores than other drug-use patterns. We used an initial linear regression model that included only route of use to test controlling for other variables that had an alpha level less than or equal to 0.20 in the t-tests or analysis of variance. Statistically significant additional variables, included in the final model, had an alpha level less than or equal to 0.00.

Results

Sample Characteristics

Of the 99 participants, 59 identified themselves as users and 40 as nonusers. There were no significant differences in the gender, age, ethnicity, education, employment or homeownership status between users and nonusers (TABLE 1). The participants were mostly Caucasian (56.6 percent) males (79.8 percent) in their fourth decade of life (32.7 years). The majority of participants had 12 years of education (38.4 percent), were employed (61.6 percent) and did not own a home (84.8 percent).

Alcohol use was self-reported by the participants and analyzed as a potential risk factor for meth mouth. Overall, 59.6 percent of participants reported using alcohol. We found that alcohol use was significantly higher among users than nonusers [69.5 percent versus 45.0 percent; P = 0.02].

Characteristics and Dental Care Access of Incarcerated Methamphetamine Users and Nonusers¹

		Entire sample (n = 99)	Meth users (n = 59)	Nonusers (n = 40)
Gender	Male	79 (79.8%)	47 (79.7%)	32 (80.0%)
	Female	20 (20.2%)	12 (20.3%)	8 (20.0%)
Age	Mean age in years ± SD	32.7±10.8	32.3 ± 9.3	33.4 ± 12.8
	Range	18.7 - 63.9	19.6 - 53.7	18.7 - 63.9
	Median	30.7	31.2	28.9
Ethnicity	Caucasian	56 (56.6%)	38 (64.4%)	18 (45.0%)
	Hispanic	16 (16.2%)	8 (13.6%)	8 (20.0%)
	Other	27 (27.3%)	13 (22.0%)	14 (35.0%)
Educational attainment	Less than high school	27 (27.3%)	20 (33.9%)	7 (17.5%)
	High school or equivalent	38 (38.4%)	22 (37.3%)	16 (40.0%)
	More than high school	34 (34.3%)	17 (28.8%)	17 (42.5%)
Employment status	Employed	61 (61.6%)	36 (61.0%)	25 (62.5%)
	Unemployed	27 (27.3%)	17 (28.8%)	10 (25.0%)
	Unemployed disabled	11 (11.1%)	6 (10.2%)	5 (12.5%)
Homeownership	Yes	15 (15.2%)	7 (11.9%)	8 (20.0%)
	No	84 (84.8%)	52 (88.1%)	32 (80.0%)
Alcohol use	Yes	59 (59.6%)	41 (69.5%)*	18 (45.0%)
	No	40 (40.4%)	18 (30.5%)	22 (55.0%)
Dental insurance status*	Have dental insurance	40 (40.8%)	22 (37.3%)	18 (46.2%)
	Do not have dental insurance	58 (59.2%)	37 (62.7%)	21(53.8%)
Length of time since last dental visit*	Within the past year	41 (42.3%)	27 (45.8%)	14 (36.8%)
	Between 1-2 years	22 (22.7%)	14 (23.7%)	8 (21.1%)
	Between 2-5 years	20 (20.6%)	10 (16.9%)	10 (26.3%)
	More than 5 years	11 (11.3%)	7 (11.9%)	4 (10.5%)
	Never received dental care	3 (3.1%)	1 (1.7%)	2 (5.3%)
Reason for last dental visit	Emergency/toothache	49 (49.5%)	36 (61.0%)*	13 (32.5%)
	Routine care	30 (30.3%)	13 (22.0%)	17 (42.5%)
	Other	17 (17.2%)	9 (15.3%)	8 (20.0%)
	Never received dental care	3 (3.0%)	1 (1.7%)	2 (5.0%)
Location of dental care*	Private dental office	47 (48.0%)	28 (48.3%)	19 (47.5%)
	Community health clinic	23 (23.5%)	12 (20.7%)	11 (27.5%)
	Prison/jail dental clinic	17 (17.3%)	12 (20.7%)	5 (12.5%)
	Other	7 (7.1%)	4 (6.9%)	3 (7.5%)
	Hospital emergency room	1 (1.0%)	1 (1.7%)	0 (0.0%)
	None	3 (3.1%)	1 (1.7%)	2 (5.0%)

¹Participants self-reported demographic characteristics and dental care access. *Missing or incomplete response for characteristic. *P = 0.02 versus nonuser control by χ^2 analysis. *P = 0.04 versus nonuser control by χ^2 analysis.

Dental Care Access

The primary measure of dental care access was participants' dental insurance status. The majority of participants (59.2 percent) indicated that they were uninsured and there were no significant differences in the insurance status between users and nonusers (TABLE 1).

Our secondary measures of dental care access were length of time since the last dental visit, reason for their last dental visit and primary location of dental care. Of all participants, 42.3 percent reported a dental visit within the past year with no significant differences between users and nonusers [45.8 percent versus 36.8 percent; P = 0.65]. Three participants (3.1 percent) reported never receiving dental care. A toothache or other dental emergency was most frequently cited by all participants (49.5 percent) as the reason for their last dental visit. Users reported an emergency dental visit more frequently than nonusers [61.0 percent versus 32.5 percent; P = 0.04]. Private dental offices (48.0 percent) were cited as the predominant location for dental care by all participants, followed by community clinics (23.5 percent), prison/ jail clinics (17.3 percent), other unspecified locations (7.1 percent) and hospital emergency rooms (1.0 percent) (**TABLE 2**).

Decay History

To determine the decay history of participants, we used the DMFT index. The mean DMFT score of participants was 13.9 ± 6.7 (TABLE 2). Users had a higher mean DMFT score than nonusers [15.2 ± 6.3 versus 12.0 ± 7.0 ; P = 0.02].

Meth Mouth Severity Among Methamphetamine Users

The severity of meth mouth varied among users as noted by the range in DMFT scores (**TABLE 2**). The number of

Decay History of Incarcerated Methamphetamine Users and Nonusers²

decayed teeth ranged from 0 to 24 teeth. The number of missing teeth ranged from 0 to 21 teeth and the number of filled teeth ranged from 0 to 15 teeth. The total DMFT score ranged from 0 to 28 teeth.

Impact of Drug-use Patterns on Meth Mouth Severity

The effects of drug patterns specifically duration, frequency, dosage, route of use and co-abuse with alcohol — on DMFT scores were assessed for users using independent t-tests and analysis of variance (TABLE 3). Users of more than 10 years had a higher mean DMFT score [17.4 ± 6.3 versus 11.9 ± 6.4; P = 0.05] than users of less than one year. There were nonsignificant trends toward increased DMFT scores with increased frequency and dosage of methamphetamine. A significant percentage of users self-reported an oral route of use than non-oral routes [78.0 percent versus 22.0 percent; P = 0.00]. There was a nonsignificant trend toward higher DMFT scores among oral users of the drug. Co-abusers of methamphetamine and alcohol had fewer missing teeth $[2.3 \pm 2.3 \text{ versus } 4.9]$ \pm 6.9; P = 0.03] than users who denied alcohol co-abuse. However, the number of teeth that were decayed or filled did not differ significantly between these two groups nor did the DMFT scores.

We performed a stratified analysis and found that duration of use was positively associated with age (**TABLE 3**). Users of more than 10 years were significantly older than those who used for less than one year [37.6 \pm 8.8 versus 28.2 \pm 8.0; (3) = 3.29; P = 0.03].

A series of multiple linear regression analyses were performed to test the hypothesis that repeated oral exposures to methamphetamine are more significant predictors of DMFT scores than repeated non-oral exposures (TABLE 4). We considered a variable, called an interaction term, that accounted for the positive association of duration of use with age and found it not to be significant and this variable was not included in our linear regression modeling. The initial model [F(4) = 7.95, $R^2 = 0.25$; P = 0.00] included route of use and the covariates of age and duration that were identified as significant variables in the bivariate analyses. This model, which was statistically significant, identified oral route of use and age as being predictive covariates of DMFT scores, and non-oral routes of use and duration of use as being nonsignificant contributors. We found that oral drug use and age attenuated the effect of duration of use. In Model 2, we excluded duration of use and assessed the predictive value of route of use and age on DMFT scores. Model 2 was statistically significant and explained 24 percent of the variance in DMFT scores. Oral route of use (P <0.001) and age (P <0.001) continued to be predictors of DMFT scores in this model, whereas non-oral routes were not. Model 2 was selected as the final model because the exclusion of duration as a covariate did not result in a statistically significant change in performance of the model [F(3) = 9.92, R² = 0.24; P = 0.00] and still explained 24 percent of the variance in DMFT scores.

and filled teeth were recorded. *P =0.02 versus nonuser control by t-test.

Impact of Dental Care Access on Meth Mouth Severity

The impact of insurance status of users, a measure of dental care access, on decay history was measured (**TABLE 3**). Insured users had more filled teeth than uninsured users $[4.6 \pm 4.4$ versus 2.6 ± 3.4 ; P = 0.05].

Discussion

This study reveals the critical role that drug-use patterns play in the varying degrees of meth mouth severity observed among users. Previous studies have found that methamphetamine use is detrimental to oral health, with users having more decayed or missing teeth than nonusers.^{19,20} In this study, we found that methamphetamine users have more teeth affected by decay, as evidenced by higher DMFT scores, than nonusers; a finding consistent with the current body of knowledge on meth mouth.^{2, 4,17,18,19,20} However, few studies have assessed whether drug-use patterns influence meth mouth severity and whether access to dental care further contributes to its severity, which were the purposes of this study.

In this study, we found that duration of use significantly increased meth mouth severity, compared to the druguse patterns of frequency, dosage, route of use and alcohol co-abuse in our bivariate analyses. Further, we found that users of more than 10

		Entire sample (N = 99)	Users (n = 59)	Nonusers (n = 40)
Decayed teeth	Mean ± SD	8.1 ± 5.7	8.8±5.9	7.0 ± 5.4
	Range of severity	0.0 - 24.0	0.0 - 24.0	0.0 - 19.0
Missing teeth (due to decay)	Mean ± SD	2.6 ± 3.8	3.1 ± 4.4	1.8 ± 2.7
	Range of severity	0.0 - 21.0	0.0 - 21.0	0.0 - 9.0
Filled teeth	Mean (SD)	3.3 ± 3.5	3.4 ± 3.9	3.2 ± 2.7
	Range of severity	0.0 – 15.0	0.0 - 15.0	0.0 - 10.0
Total DMFT	Mean (SD)	13.9 ± 6.7	15.2 ± 6.3*	12.0 ± 7.0
	Range of severity	0.0 - 28.0	0.0 - 28.0	0.0 - 26.0

² A dentist performed a visual oral examination on each participant. The numbers of decayed, missing (extracted due to decay)

Severity of Meth Mouth Based Upon Drug-use Patterns and Dental Care Access of Incarcerated Methamphetamine Users³

		MA users	Decay	Missing	Filled	DMFT	Age
Duration of use (N = 57)*	Less than 1 year	13 (22.8%)	6.8±5.4	2.3 ± 5.7	2.8 ± 3.3	11.9 ± 6.4	28.2 ± 8.0□
	Between 1 and 5 years	14 (24.6%)	7.8±6.4	1.4 ± 1.6	4.5 ± 5.1	13.6±6.5	30.9±10.0
	Between 6 and 10 years	13 (22.8%)	9.5±6.2	4.0 ± 3.6	3.8±3.9	17.3 ± 5.2	30.6 ± 8.2
	More than 10 years	17 (29.8%)	11.1 ± 5.3	4.4 ± 5.3	2.0 ± 2.3	17.4 ± 6.3*	37.6±8.8□
Frequency of use (N = 59)	Daily	27 (45.8%)	9.1±6.5	3.1 ± 4.8	3.6 ± 3.7	15.7±6.9	1
	3-4 times/week	17 (28.8%)	9.7 ± 5.8	3.5 ± 2.9	2.8 ± 4.2	16.0 ± 5.9	
	3-4 times/month	7 (11.9%)	6.1±4.9	4.1±7.6	4.6 ± 5.7	14.9 ± 6.7	·
	Less than 3-4 times/month	8 (13.6%)	8.1 ± 5.2	1.1 ± 1.1	2.9±1.9	12.1 ± 4.7	,
Dosage (N = 59)	Less than ¼ gram/use	22 (37.3%)	7.9 ± 4.4	2.3 ± 4.5	3.5±4.2	13.6 ± 5.0	1
	1⁄4-1⁄2 gram/use	15 (25.4%)	9.7±7.8	2.0 ± 2.4	3.7 ± 4.1	15.5±8.0	
	More than ½ gram/use	22 (37.3%)	9.1 ± 5.9	4.5 ± 5.1	3.0 ± 3.6	16.6±6.2	1
Route of use (N = 59)	Oral (smoking)	46 (78.0%)¶	9.2±6.1	3.5 ± 4.8	3.2 ± 3.5	15.9±6.2	31.8±8.7
	Non-oral (IV/IN)	13 (22.0%)	7.4 ± 5.1	1.4 ± 1.4	4.2 ± 5.0	12.9 ± 6.3	34.1 ± 11.2
Alcohol use (N = 59)	Yes	41 (69.5%)	9.0±6.6	2.3 ± 2.3*	3.3 ± 3.9	14.6±6.4	
	No	18 (30.5%)	8.3 ± 4.1	4.9±6.9	3.5±4.0	16.6±6.0	-
Dental insurance (N = 59)	Have dental insurance	22 (37.3%)	7.7 ± 5.2	3.0 ± 5.5	4.6±4.4§	15.4 ± 5.5	1
	No dental insurance	37 (62.7%)	9.4±6.3	3.1 ± 3.7	2.6 ± 3.4	15.1 ± 6.8	

³A dentist performed a visual oral examination on each participant. The numbers of decayed, missing (extracted due to decay) and filled teeth were recorded. The participants self-reported their drug-use patterns. IV/IN = intravenous and intranasal methamphetamine use. Data are means ± SD.*Indicates missing or incomplete responses. *P = 0.05 for analysis of variance for duration of use and DMFT. □ P = 0.03 for analysis of variance for duration of use and age. ¶P = 0.00 versus non-oral route of use by χ_2 analysis. *P = 0.03 vs. nonalcohol use by t-test. \$P = 0.05 versus noninsured by t-test.

years had more severe meth mouth, with more teeth currently decayed, missing (from extractions) or filled, than users reporting shorter drug-use histories. The multiple linear regression analysis allowed us to examine the effects of several drug-use patterns simultaneously and their influence on meth mouth severity. We found that although duration of use was significant in increasing meth mouth severity, this effect was diminished when we considered route of use. In our regression model, we demonstrated that oral use of methamphetamine from smoking is a stronger predictor of meth mouth severity than duration of use, when age is controlled. This finding is consistent with what is known about the decay process and what has been hypothesized about the rampant

tooth decay observed among some methamphetamine users. Users who smoke methamphetamine have a direct oral exposure to this highly acidic drug. Ravenel et al. found highly acidic saliva among a sample of methamphetamine smokers.⁴ It is well established that the formation and progression of tooth decay requires an acidic oral environment that demineralizes enamel and dentin.²⁶ Further intensifying this effect is the drug's stimulated release of dopamine, which results in chronic hyposalivation^{8,9} and sugar cravings,¹¹ factors that likely accelerate the decay process. Therefore, successful dental management of methamphetamine patients will require that dental professionals use products known to replenish saliva, neutralize oral acidity and remineralize enamel.

In bivariate analysis, we found that users with dental insurance, a measure of dental care access, had more filled teeth than uninsured users. Although we found no significant difference in overall meth mouth severity (DMFT) between insured and uninsured users, the inclusion of a restorative component (FT) provided a more comprehensive analysis of the decay history of our sample.

Surprisingly, we found that alcohol co-abuse was not a significant risk factor for meth mouth severity. We investigated alcohol co-abuse for two reasons. First, the report of methamphetamine use with alcohol is high, with one study reporting a prevalence rate of 100 percent.²² Second, the impact of this exposure on meth mouth has not previously been reported. The types of alcoholic beverages

Association of Meth Mouth Severity With Route of Use, Age and Duration: Linear Regression Model⁴

Route of use	Decay	Missing	Filled	DMFT	
None (nonuser)	7.0 ± 5.4	1.8 ± 2.7	3.2 ± 2.7	12.0 ± 7.0	
Oral (smokers)	9.2 ± 6.1)	3.5 ± 4.8	3.2 ± 3.5	15.9 ± 6.2	
Non-oral (IV/IN)	7.4 ± 5.1	1.4 ± 1.4	4.2 ± 5.0	12.9 ± 6.3	
Predictor Variables	R ²	F	B (SE)	β	Р
Model 1 (Null)	0.25	7.95			0.00 [†]
Oral route			4.17 (1.29)	0.31	0.00 ⁺
Non-oral route			1.46 (1.98)	0.07	0.46
Age			0.23 (0.06)	0.37	0.00 ⁺
Duration			1.01 (0.75)	0.13	0.18
Model 2 (Final)	0.24	9.92			0.00*
Oral route			4.28 (1.30)	0.32	0.00 [‡]
Non-oral route			0.74 (1.91)	0.04	0.70
Age			0.25 (0.06)	0.41	0.00*

⁴A multiple linear regression analysis was performed and nested models were compared. A dentist performed a visual oral examination on each participant. The numbers of decayed, missing (extracted due to decay) and filled teeth were recorded. The participants self-reported their drug-use patterns. IV/IN = intravenous and intranasal methamphetamine use. Data are means ± SD. R2 is the observed variability in DMFT scores. <code>4B (SE)</code> is the unstandardized coefficient (standard error). β is the partial regression coefficient. ⁺P = 0.00 for Model 1.⁺P = 0.00 for Model 2.

consumed during methamphetamine use were not investigated because of limited evidence of cariogenic differences between beverage types.^{27,28,29,30} In our sample, 69.5 percent of users reported alcohol use compared to 45.0 percent of nonusers, a finding that validated our inquiry. We expected, based upon the published report of higher decay rates among drug and alcohol abusers,²¹ to find higher DMFT scores among co-abusers of methamphetamine and alcohol users compared to users who denied alcohol use. We assumed that co-abusers would experience higher levels of addiction, unemployment and poverty and therefore lower levels of dental care. Unexpectedly, we found no differences in the overall decay history between the two groups but found significantly fewer missing teeth among co-abusers. Our findings support the hypothesis that co-abusers may experience more treatment barriers, such as extractions, for teeth with nonrestorable decay.

This study has a number of noteworthy strengths. Our sample size of 99 participants, including 59 users, is more robust than other published studies with fewer than 50 total participants.^{2,4,18,19} We also included a control group to provide comparison data. Further, our use of the DMFT index allowed visual identification of teeth affected by decay, both past and present — a distinction from other studies that measured only currently decayed or missing teeth.^{19,20} The underlying assumption inherent in measuring only decayed or missing teeth is that users are not heavy consumers of restorative dental care. However, we found that 45.8 percent of users reported seeing a dentist within the past year for emergency, routine and unspecified visits, during which time restorative services may have been obtained. In this study, we used the DMFT index and captured a treatment aspect that has not been frequently investigated or published.^{19,20} Finally, our multiple linear

regression analysis allowed us to evaluate the relationship between two drug-use patterns simultaneously, duration and route of use, and their predictive value in influencing meth mouth severity.

However, our findings need to be viewed in context with the study's limitations. First, 27 percent of eligible participants chose not to participate in the study. It is unknown whether these nonparticipants were more likely to be users or to possess other traits of interest to the investigators. Second, the study relied upon selfreports of drug use which are subject to participants' recall and truthfulness. We had four self-identified nonusers with 16 or more decayed teeth and their denial of methamphetamine use was suspicious. According to examiner recall, the teeth were primarily decayed on cervical and interproximal surfaces, a pattern that is characteristic of meth mouth. However, a systematic review demonstrates that drug use self-reports are reliable and valid measures and have high concordance with independent biomarkers of drug use.³¹ Third, visual examinations, without the added benefit of radiographs, may have underreported the number of decayed teeth by up to 44 percent.³² Fourth, our sample size of 99 may not have been large enough to detect differences at an alpha level of 0.05.

Conclusion

Meth mouth is one of the most visible consequences of methamphetamine use. In this study, we identified risk factors that influence the severity of meth mouth. We found that an oral route of use (smoking) is a stronger predictor of meth mouth severity than non-oral routes (intravenous or intranasal) and duration of use. To successfully manage patients who use methamphetamine, dental professionals need to first consider that patients with significant decay histories may be using methamphetamine and, if so, should inquire about their preferred route of use. Secondly, dental professionals need to inform these patients of the dental consequences associated with continued use. Finally, dental professionals need to use specific preventive measures to mitigate the known oral effects of methamphetamine.

REFERENCES

1. Department of Health and Human Services, National Institute on Drug Abuse. NIDA infofacts: methamphetamine. www.nida.nih.gov/infofacts/methamphetamine.html. Updated March 2010. Accessed: 2011-07-26. (Archived by WebCite at www.webcitation.org/60TSpS36I).

2. Shaner JW, Kimmes N, Saini T, Edwards P. "Meth mouth:" rampant caries in methamphetamine abusers. AIDS Patient Care and STDs 2006;20:146-150.

3. American Dental Association. For the dental patient: methamphetamine use and oral health. J Amer Dent Assoc 2005:136:1491.

4. Ravenel MC, Salinas CF, Marlow NM, Slate EH, Evans ZP, Miller PM. Methamphetamine abuse and oral health: A pilot study of "meth mouth." Quintessence Int 2012;43:229-237. 5. Montana Meth Project. Meth info. Montana Meth Project. 2011-07-26. www.montanameth.org/Meth_Info/index.php.php. Accessed: 2011-07-26.

6. Comings DE, Blum K. Reward deficiency syndrome; genetic aspects of behavioral disorders. Prog Brain Res 2000;126:325-341.

7. Halkitis PN, Fischgrund BN, Parsons JT. Explanations for methamphetamine use among gay and bisexual men in New York City. Subst Use Misuse 2005;40:13311345. 8. Sonsalla PK, Gibb JW, Hanson GR. Roles of D1 and D2 dopamine receptor subtypes in mediating the methamphetamine-induced changes in monoamine systems. J Pharmacol Exp Ther 1986;238:932-937.

9. Saini T, Edwards PC, Kimmes NS, Carroll LR, Shaner JW, Dowd FJ. Etiology of xerostomia and dental caries among methamphetamine abusers. Oral Health Prev Dent 2005;3:189-195.

10. Lobbezoo F, Naeije M. Bruxism is mainly regulated centrally, not peripherally. J Oral Rehabil 2001:28:1085-1091. 11. Rada P, Avena NM, Hoebel BG. Daily bingeing on sugar repeatedly releases dopamine in the acumbens shell. Neuroscience 2005;135:737-744.

12. McGrath C, Chan B. Oral health sensations associated with illicit drug abuse. Br Dent J 2005;198:159-162.

13. Llena-Puy C. The role of saliva in maintaining oral health and as an aid to diagnosis. Med Oral Patol Oral Cir Bucal 2006;11:E449-E455.

14. Humphrey SP, Willliamson RT. A review of saliva: Normal composition, flow, and function. J Prosthet Dent 2001;85:162-169

15. Shimshon S, Levin L. Gingival recession in young adults: Occurrence, severity, and relationship to past orthodontic treatment and oral piercing. Am J Orthod Dentofacial Orthop 2008;2008;134:652-656.

16. Avena NM, Hoebel BG. A diet promoting sugar dependency causes behavioral cross-sensitization to a low dose of amphetamine. Neuroscience 2003:122:17-20. 17. Donaldson M, Goodchild, JH. Oral health of the methamphetamine abuser. Am J Health-Syst Pharm

2006:63:2078-2082. 18. Cretzmeyer M, Walker J, Hall JA, Arndt S.

Methamphetamine use and dental disease: results of a pilot study. J Dent Child 2007;74:85-92.

19. Morio MA, Marshall TA, Qian F, Morgan TA. Comparing diet, oral hygiene and caries status of adult methamphetamine users and nonusers: a pilot study. J Am Dent Assoc 2008;139:171-176.

20. Shetty V, Mooney LJ, Zigler CM, Belin TR, Murphy D, Rawson R. The relationship between methamphetamine use and increased dental disease. J Am Dent Assoc 2010;141:307-318.

21. Dasanayake AP, Warnakulasuriya S, Harris CK, Cooper DJ, Peters TJ, Gelbier S. Tooth decay in alcohol abusers compared to alcohol and drug abusers. Int J Dent 2010;786503:1-6. 22. Sommers I, Baskin D, Baskin-Summers, A. Methamphetamine use among young adults: Health and social consequences. Addict Behav 2006;31:1469-1476. 23. Laslett A, Dietze P, Dwyer R. The oral health of streetrecruited injecting drug users: prevalence and correlates of problems. Addiction 2008;103:1821-1825.

24. World Health Organization. Oral health surveys: basic methods. Geneva: 1987.

25. Klein H. Studies on dental caries: dental status and dental needs of elementary school children. Public Health Rep 1938:53:751-765.

26. Stookey GK. The effect of saliva on dental caries. J Am Dent Assoc 2008;139:11S-17S.

27.Hede B. Determinants of oral health in a group of Danish alcoholics. Eur J Oral Sci 1996;104:503-408. 28. McCann SE, Sempos C, Freudenheim JL, Muti P, Russel

M, Nochajski TH, Ram M, Horvey K, Trevisan M. Alcoholic beverage preference and characteristics of drinkers and nondrinkers in western New York (United States). Nutr Metab Cardiovas 2003;13:2-11.

29. Mortensen Ell. Jensen HH. Sanders SA. Reinisch JM. Better psychological functioning and higher social status may largely explain the apparent health benefits of wine: a study of wine and beer drinking in young Danish adults. Arch Intern Med 2001;161:1844-1848.

30. Meurman JH, Vesterinen M. Wine, alcohol, and oral health, with special emphasis on dental erosion. Quintessence Int 2000;31:729-733.

31 Darke S. Self-report among injecting drug users: a review. Drug Alcohol Depen 1998:253-263.

32. Becker T, Levin L, Shochat T, Einy S. How much does the DMFT index underestimate the need for restorative care? J Dent Educ 2007:71:677-81.

THE CORRESPONDING AUTHOR, Ronni E. Brown, DDS, MPH, can be reached at dr.ronnibrown@ucla.edu.



Salt Fluoridation — An Adjunct to Water Fluoridation

JACK M. SAROYAN, DDS

ABSTRACT This letter is from a former editor of the *Journal of the California Dental Association* who has been instrumental in increasing awareness about the benefits of salt fluoridation for areas of the country where water fluoridation is not feasible or is cost prohibitive.

AUTHOR

Jack M. Saroyan, DDS, is a past president of the San Francisco Dental Society and the California Board of Dental Examiners. He is currently on the adjunct faculty as a clinical assistant professor at the Arthur A. Dugoni School of Dentistry in San Francisco.

he dental profession began championing community water fluoridation (CWF) 68 years ago in Grand Rapids, Mich. Since then, CWF has been implemented in communities with more than 50,000 people across the United States. It has served most Americans well by improving their dental health and saving them a lot of money and time in the dental chair. Moreover, it raised the public's esteem for dentists. Today, about 72 percent of Americans and 62 percent of Californians have CWF. This has resulted in a 40 to 60 percent reduction in dental decay and the chance to keep one's teeth for a lifetime.

But what about the 90 to 100 million Americans, of which there are 10 to 11 million Californians, who live in areas too small to economically implement CWF? Isn't it about time we reach out and serve all the people in this country equally? Why can't they have fluoride in their diet for fewer cavities, too?

They can. There is another kind of fluoridation that uses table salt, called salt fluoridation. This form of fluoridation has been used successfully in Switzerland for more than 55 years. It is predictably used throughout Europe and Central and South America. More millions of people use salt fluoridation for caries prevention and control. It has been approved and recommended by the World Health Organization to be equally effective in preventing dental decay. In a special meeting on oral health that convened in May 2007, a resolution was passed that said when water fluoridation was not economically feasible, salt fluoridation should be implemented. For example, Mexico has had water fluoridation in Mexico City for many years. With the completion of a salt fluoridation program in 2012, the entire population has the benefits of fluoride in their diet.

What are some of the arguments against the implementation of salt fluoridation in the United States? Some dentist proponents of CWF have said that having salt fluoridation available would give the anti-fluoridationists another reason to oppose the implementation of CWF. As true as that may be, how much sense does that argument make to parents of children who will never have CWF? Shouldn't Americans be able to buy table salt with known and proven health benefits for their children and themselves like the rest of the world?

Another argument may be made that if people in CWF areas also use the fluoridated salt they would get too much fluoride and that may cause fluorosis. This is certainly possible. However, the salt manufacturers can be directed to have labels restricting the use of fluoridated salt in CWF areas. It is known that wherever any kind of fluoridation is available, there may be some fluorosis. Young children under the age of 6 must be monitored so that they do not swallow fluoridated toothpaste. However, as dentists, we know that there are several degrees of fluorosis that are not cosmetically significant.

Community water fluoridation has about 0.7 mg to 1.2 mg of fluoride in the water. This results in an intake of about one part per million. Fluoridated salt contains 200 mg to 250 mg per kilo of salt or 2.2 pounds of salt. This equates to another one part per million intake. According to the Institute of Medicine, Food and Nutrition Board, children over the age of 9 can tolerate 2.0 mg per day without adverse effects. Older children and adults can tolerate 4 mg per day. The Environmental Protection Agency allows an upper limit for adults to 6 mg per day. Therefore, if a child over the age of 9 or an adult used fluoridated salt and was in an area of CWF, they would not have an adverse effect.

You can have a say in this matter of making salt fluoridation available to your patients and people throughout the country who do not have CWF. There is a recent petition before the Food and Drug Administration to add potassium fluoride, a micronutrient, to iodized table salt for the prevention of dental decay. The FDA invites comments by the profession and the public on this proposal.

To make your comments, go to regulations.gov and type in FDA 2012-p-1179 in the Search bar. On the next screen, you can read what others have written and make your own comment in the space provided. Do it today.

One tap to everything CDA.

Now, content that's updated daily on the new **cda.org** is just a touch away when you create a CDA shortcut on your smartphone or tablet's home screen. Think of it as an easy shortcut to all things CDA, especially breaking news and updates. Using your smartphone or tablet, visit CDA's website and select your browser's bookmark option. Choose the "add to home screen" option and, voilá, an icon that resembles an app will appear on your home screen. And just like that, you're one quick tap away.



Tech Trends



A look into the latest dental and general technology on the market.

Motorola Droid Razr HD

In today's world of interdisciplinary dentistry and team treatment, and with dentists working more closely together, staying connected with colleagues has never been more important. That's why having a reliable and functional personal phone — or smartphone — is so important. The Motorola Droid Razr HD is both reliable and functional. Sharing clinical and laboratory images, for example, is very important today. Waiting to receive and view information-critical photographic images on the practice computer can slow operations down. That's where the HD display on the Droid Razr delivers great functionality. It allows dentists and their colleagues to view clinical photography — and engage in collaborative decisions and discussions — anywhere. The 4.7-inch HD display delivers vibrant clarity similar to what users may experience when watching an HDTV. This higher resolution means outstanding visual detail and case notes/files that are easier to read. No matter where you are, you'll be able to knowledgeably consult on a case and collaboratively make the most appropriate treatment decision. Just like a great office manager who keeps everything in the practice running smoothly, the Motorola Droid Razr HD and the Android platform provide the functionality, seamless operation and application versatility necessary to help any busy dentist not just manage, but master, his/her schedules. There are many Microsoft applications for just about everything dentists need to accomplish in their day. A single charge of the phone's battery provides 24 hours of performance. It's also durable. It's made with advanced composite materials, so it resists bumps and has a tough finish. The display is protected from scrapes and scratches with Corning Gorilla Glass, and the water-repellent nano-coating inside and outside helps to protect against spills and splashes. From writing reports to sending emails, viewing and annotating images to managing a calendar and receiving reminders, this phone does it all. —Stephen Brattesani, DDS

Fotor – Photo Effect Studio (Everimaging Co. Ltd.)

Instagram dominates the mobile photo editing app landscape these days, but there are plenty of others that function similarly and provide a more hands-on experience. One of those apps is Fotor. With several photo-editing options, think of this free app as a mini version of Photoshop for a mobile phone. On top of having a long list of preset photo filters, which is what Instagram offers, Fotor takes it to another level with the ability to rotate photos as well as tweak brightness, contrast, saturations, sharpness, tint and shadows. A scrolling bar under each filter allows users to hand-select what they want the final product to look like. There are more than 60 effects in categories such as art and vintage. Fotor, which is available for iOS and Android users, also features a "1-Tap Enhance" mode that provides a pixel-by-pixel enhancement, and "tilt shift," which gives users the option to select various focus effects. There are more than 15 borders to choose from to frame photos and the "favorites" option lets users save their favorite filters to avoid having to scroll through several menu layers later. The share function gives users the opportunity to share photos on Facebook, Twitter, Flickr, email and Instagram. Users can upload photos that are already saved in the phone's album, but Fotor also comes with a built-in camera. However, the camera isn't the greatest and sometimes takes pixelated photos. The developers have added a stabilizer feature to the camera that attempts to increase the sharpness. Another minor flaw with the app is that it can sometimes take a while for photos to save after they have been edited. But with a 4.5-out-of-5-star rating on both Google Play and the iTunes Store, this app will give those who appreciate putting some creative juice into their photos a lot of options. If the avid mobile photographer is looking for something a little more outside of the norm as far as photo editing apps go, they won't be disappointed with the functionality and performance of Fotor. —Blake Ellington, Tech Trends Editor



Canon Rebel T4i

In 2010, Canon changed the digital SLR camera landscape when it launched the Rebel T2i. Suddenly, amateurs had the option to capture professional-quality photos and video at an inexpensive base price. The newest version of the camera, the Rebel T₄i, elevates the Rebel experience for users. The T₄i is an 18-megapixel camera that shoots 108op video. Alongside the easy-to-use settings and setup right out of the box, comes a handy new touchscreen that flips out from the base of the camera for optimal video recording. Users have the option of using the touchscreen or the manual buttons found to the right of the screen to toggle through settings and menus. The touch screen does reduce tedious searching through menu layers by allowing users to touch directly where they want to go. Also new to this model is the autofocus (Movie Servo) setting, which comes in handy when shooting photos and video. To take full advantage of this setting, however, users will need an upgraded Stepper Motor lens. Using Movie Servo with a basic lens can be frustrating and noisy (the microphone will pick up the clicking from the camera trying to focus on the subject). The T4i boasts ISO capabilities of 12,800 for use during low light, as well as an upgraded image processor. Several scene modes, such as sports mode and landscape mode, make taking photos easy for new users, although the manual mode lets more experienced camera users program their own settings. The camera also includes a built-in stereo microphone and a jack for an external microphone. For those who already own earlier models of the Rebel, it will be an easy transition into the T_4i — the location of the buttons is similar to previous models and the touchscreen is easy to learn. The layout will be easy for new users as well, making it simple for them to get up and running quickly. Outside of the touchscreen and upgraded ISO limits and image processor, there aren't too many things that distinguish the T₄i from the T₃i. The camera lacks an impressive exterior look as Canon stuck with bland black coloring and a block-style frame. Overall, the camera gets the job done and is reasonably priced in the \$800 range. With more handheld video recording devices hitting the market, it is unclear how long SLR cameras will maintain their relevance, but the T₄i is worth looking into for those who are interested in taking professional-quality photos and video. -Blake Ellington, Tech Trends Editor

Twitter #music (Free, Twitter Inc.)

From the social networking company Twitter comes a music discovery app that changes the way users find their music. Unlike streaming Internet radio services that track user preferences when playing a song to approximate what a user would like to listen to next, Twitter #music leverages the power of its own social network to show users what the Twittersphere is listening to. The main screen of the app directs users to the Popular chart, which displays trending new music on Twitter organized into individual artist usernames and song titles. Selecting a particular artist will expand the artist's Twitter profile photo and allow users to either play a preview of the trending song and/or view the artist's account profile. When viewing the artist's profile, users have the ability to easily tap a "follow" button to become a follower of the artist using their own Twitter accounts. Other charts are available from the drop-down menu at the top of the screen. The "Emerging" chart displays unknown artists and their songs that have become popular based on Twitter feeds. The "Suggested" chart utilizes a user's Twitter account and provides artist/song suggestions based on who the user is following on Twitter. The "#NowPlaying" chart displays artists/songs that the user's followers on Twitter are currently listening to. The "Me" chart displays all the artists that a user follows. Selecting an artist/song from any of the charts will similarly allow a user to listen to a preview and/or view an artist's Twitter account profile. Users can conveniently purchase any music previewed directly through iTunes on their device. Users can also stream full tracks instead of previews if they add their Spotify and/or Rdio account credentials to the app. Spotify and Rdio are both subscription-based Internet music-streaming services. The interface is intuitive and easy to use. The artists/songs that appear in a chart are easily selected with a single tap. Users can also search for an artist by selecting the magnifying glass in the upper right corner. The app does not have the ability to look at a user's locally stored music to provide new song or artist suggestions. Twitter users can rejoice, for there is a new way to use the power of social networking to discover music. —Hubert Chan, DDS

Would you like to write about new technology?

Dentists interested in contributing to this section should contact Tech Trends Editor, Blake Ellington, at blake.ellington@cda.org.

Continuing Education Courses

Listed are C.E. courses offered by California's dental schools, local dental societies, ethnic dental societies and specialty organizations, from July through December 2013. For more information, please contact the course provider.

торіс	DATE	LECTURER(S)	LOCATION	соѕт	UNITS
ARAB AMERICAN DENTAL SOCIETY				626.3	35.6888
Extraction for General Dentist	Aug. 4	Bach Le, DDS	Pasadena	\$145	7
Implant Restoration and Implant Supported Overdenture	Oct. 28	Nadim Baba, DDS	Pasadena	\$145	7
ARTHUR A. DUGONI SCHOOL OF DEI	NTISTRY CONTINU	ES ON NEXT PAGE		dental.pacific	.edu/ce1
Certification in Radiation Safety for Allied Dental Professionals	July 13, Aug. 3	Elena Francisco, BSDH, RDHAP, MS, and Elham Mahdavi, DDS	San Francisco	\$645	32
Implant Treatment Planning Seminars	July 15, 22, 29; Aug. 5, 12, 19, 26; Sept. 9, 16, 23	Edmond Bedrossian, DDS	San Francisco	\$795	15
Hospital Dentistry	July 20-21	Paul Glassman, DDS, MA, MBA, and Allen Wong, DDS, EdD	San Francisco	\$335 dentist; \$295 ADHP	11
Don't Just Inject, Add Some Finesse: Local Anesthesia Hands-on Workshop	July 27	Alan W. Budenz, DDS, MS, MBA, and Bernadette Alvear Fa, DDS	San Francisco	\$425	7
RDAEF Program	Aug. 10-May 4	Molly P. Newlon, DDS	San Francisco	\$18,895 RDAs; \$14,895 existing RDAEFs	342 - 410
2-D/3-D Digital Imaging: The Future Is Now	Sept. 21	Bruno Correa de Azevedo, DDS, MS	San Francisco	\$245	7
Perinatal Oral Health: Clinical Guidelines and Best Practices	Sept. 26	Irene V. Hilton, DDS, MPH	San Francisco	\$75	2
The Essentials of Aesthetics	Sept. 28	Howard Chi, DDS, MA; Maritza Mendez, DMD	San Francisco	\$395	7
The Art and Science of Aesthetic Dentistry: A Hands-on Workshop	Oct. 4-6	Dino S. Javaheri, DMD	San Francisco	\$1,095	23
Certification in Radiation Safety for Allied Dental Professionals	Oct. 5, 26	Elena Francisco, BSDH, RDHAP, MS, and Elham Mahdavi, DDS	San Francisco	\$645	32
Implant Treatment Planning Seminars	Oct. 7, 14, 21, 28; Nov. 4, 11, 18, 25; Dec. 2, 9	Edmond Bedrossian, DDS	San Francisco	\$795	15
Where Science Intersects Practice: 6th Annual Pacific Dental Hygiene Conference	Oct. 12	Ann Eshenaur Spolarich, RDH, PhD, and Deborah Horlak, RDH, MA	San Francisco	\$245 dentist; \$165 ADHP	6
Infection Control and the California Dental Practice Act	Oct. 19	Eve Cuny, BA, MS, and Bruce Peltier, PhD, MBA	San Francisco	\$125	4
Occlusal Appliances: When, How and the Evidence	Oct. 24	Andrew Young, DDS, MSD	San Francisco	\$75	2
Avoiding Legal Minefields in Dental Practice: A Seminar for New, Practicing and Retiring Dentists	Oct. 26	Ali Oromchian, Esq.	San Francisco	\$295	6

торіс	DATE	LECTURER(S)	LOCATION	COST	UNITS
ARTHUR A. DUGONI SCHOOL OF DEI	NTISTRY CONTINUE	D		dental.pacific	.edu/ce1
Dental Management for Patients with Complex Medical Conditions	Nov. 2	Paul Glassman, DDS, MA, MBA, and Paul Subar, DDS, EdD	San Francisco	\$245 dentist; \$185 ADHP	7
What Do I Do Now? Building Trust With Your Patients and Staff in a Confusing World	Nov. 7	William Sands, DDS, and Bruce Peltier, PhD, MBA	San Francisco	\$75	3
Lasers for Hard and Soft Tissues: A Hands-on Workshop	Nov. 8-9	Robert Convissar, DDS	San Francisco	\$595	12
Impressions for the Digital Age: A Hands- on Workshop	Nov. 16	Marc J. Geissberger, DDS, MA, and Bina Surti, DDS	San Francisco	\$395	7
Evidence-based Implant Treatment Planning for Practitioners	Nov. 23	Steven Sadowsky, DDS	San Francisco	\$245	7
Don't Just Inject, Add Some Finesse: Local Anesthesia Hands-on Workshop	Dec. 7	Alan W. Budenz, DDS, MS, MBA, and Bernadette Alvear Fa, DDS	San Francisco	\$425	7
BUTTE SIERRA DISTRICT DENTAL SOCIET	Y			buttesie	rradds.org
California Dental Practice Act for License Renewal	Oct. 4	Nancy Andrews, RDH	Yuba City	\$50 ADA members and staff; \$95 non-ADA and staff	2
Infection Control for License Renewal	Oct. 4	Nancy Andrews, RDH	Yuba City	\$50 ADA members and staff; \$95 non-ADA and staff	2
OSHA's Annual Bloodborne Pathogen Training	Oct. 4	Nancy Andrews, RDH	Yuba City	\$50 or comp if taking I/C and CDPA the same day	2
CPR	Oct. 4	Kelly Beard, RN; Jeannie Pittman, EMT; Kenny Cohen, EMT	Yuba City	\$65	3
Specialist's Conference	Oct. 18	Multiple Specialists	Yuba City	ТВА	6
CALIFORNIA ACADEMY OF GENERAL DEN	TISTRY				caagd.org
The Art of Endodontics: Everything Has Changed but the Anatomy	Nov. 23	L. Stephen Buchanan, DDS, FICD, FACD	Anaheim	\$95 AGD and Delta Dental member; \$295 nonmember	3
CALIFORNIA ASSOCIATION OF ORTHODOM	NTISTS			с	aortho.org
Social Media: The Basics and Beyond	Oct. 17	Aaron Molen, DDS	San Diego	\$60	1.5
Scheduling, Commitment and Cooperation	Oct. 17	Ken Alexander	San Diego	\$60	1.5
CALIFORNIA SOCIETY OF PEDIATRIC DEN	TISTRY				cspd.org
Children With Special Health Care Needs	Online video program	Paul Casamassimo, DDS, MS	Website	\$105	3
Basic Principles of Pharmacology and Sedation Pharmacology	Online video program	Thomas Lenhart, DDS	Website	\$35	1
Restorative Dentistry for Children — One Clinician's Approach	Online video program	William F. Waggoner, DDS, MS	Website	\$35	1
Management of Sedation Emergencies	Online video program	Thomas Lenhard, DDS	Website	\$35	1
Difficult Pediatric Sedation — Difficult Airways and the Obese Child	Online video program	Thomas Lenhard, DDS	Website	\$35	1
Sedation and General Anesthesia Updates for the Pediatric Dental Office	Online video program	Douglass L. Jackson, DMD, MS, PhD	Website	\$105	3
Medical Emergencies in the Pediatric Dental Office	Online recorded program	Bart Johnson, DDS, MS	Website	\$105	3
CONTRA COSTA DENTAL SOCIETY					ccdds.org
Snoring, Sleep Apnea and the Dentist — Not a Talk to Sleep Through!	Nov. 19	Brian Hockel, DDS	Concord	\$40	2

ТОРІС	DATE	LECTURER(S)	LOCATION	COST	UNITS
FRESNO-MADERA DENTAL FOUNDATION				fmdentalfoun	dation.org
Enhancing Esthetic Outcomes of Implant Restorations	July 12	TBA	Piccadilly Inn - Airport	\$140 FMDF member dentist; \$170 non-FMDF member dentist; \$90 RDH, RDA, Tech	7
ТВА	Aug. 4	TBA	Piccadilly Inn - Airport	\$140 FMDF member dentist; \$170 non-FMDF member dentist; \$90 RDH, RDA, Tech	7
Dental Law and Practice Transitions	Sept. 13	Patrick Wood, JD	Piccadilly Inn - Airport	\$140 FMDF member dentist; \$170 non-FMDF member dentist; \$90 RDH, RDA, Tech	7
Oral Facial Manifestations of Autoimmune Diseases	Oct. 4	William Carpenter, DDS, MS, and Sol Silverman Jr., DDS, MA	Piccadilly Inn - Airport	\$140 FMDF member dentist; \$170 non-FMDF member dentist; \$90 RDH, RDA, Tech	7
HARBOR DENTAL SOCIETY				harbordentals	society.org
Implants in the Aesthetic Zone	Sept. 12	Todd Schoenbaum, DDS	Lakewood	\$180 ADA member; \$80 hygienist; \$60 ADHP/ guest; \$280 nonmember dentist	7
OSHA, Infection Control and California Dental Practice Act Law	Nov. 14	Marcella Oster, RDA	Lakewood	\$180 ADA member; \$80 hygienist; \$60 ADHP/ guest; \$280 nonmember dentist	7
HDS Holiday Party with guest speaker	Dec. 5	TBD	Lakewood	\$80 ADA member; \$65 hygienist; \$50 ADHP/ guest; \$150 nonmember dentist	3
KERN COUNTY DENTAL SOCIETY				kernco	untyds.org
Infection Control, Dental Practice Act, OSHA Compliance	July 26	Diane Morgan-Arns, BS	Bakersfield	\$200 member; \$300 nonmember; \$75 ADHP	6
Common Oral Lesions	Sept. 20	Parish Sedghizadeh, DDS	Bakersfield	\$200 member; \$300 nonmember; \$75 ADHP	6
Anesthesia and Dental Emergencies	Oct. 18	Thomas Lenhart, DMD	Bakersfield	\$200 member; \$300 nonmember; \$75 ADHP	6
LOMA LINDA UNIVERSITY SCHOOL OF DE	NTISTRY			dentis	stry.llu.edu
Difficult Dentition	Sept.8	Dean Elledge, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7
Prosthetic Rehabilitation of the Completely Edentulous Patient: A Systematic Treatment Evaluation of Available Methods	Sept. 22	Tony Daher, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7
Sports Dentistry, Trauma Treatment and Prevention	Sept. 29	Ray Padilla, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7
Infection Control and California Law	Oct. 6	Bette Robin, DDS, and Nancy Andrews, RDH	Loma Linda	\$175 dentist; \$125 ADHP	7
Infection Control and California Law	Oct. 6	Bette Robin, DDS, and Nancy Andrews, RDH	Loma Linda	\$175 dentist; \$125 ADHP	7
Optimizing Success Through Materials Choice	Oct. 13	David S. Hornbrook, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7
Equilibrium	Nov. 3	Michel Magne, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7
Local Anesthesia; 30-plus Years of Hits, Misses and Near Misses	Nov. 3	Mel Hawkins, DDS	Loma Linda	\$175 dentist; \$125 ADHP	7

торіс	DATE	lecturer(s)	LOCATION	соѕт	UNITS
MARIN COUNTY DENTAL SOCIETY				mc	dsweb.org
Changing Concepts in Periodontics	Sept. 17	William Lundergan, DDS	San Rafael	\$75 member/staff; \$150 nonmember/nonmember staff	3
BLS/CPR Renewal Course	Sept. 26, Oct. 24, Nov. 21	TBD	Marin County Dental Society	\$75 member/staff; \$150 nonmember/nonmember staff	3.5
Good Bosses and Great Teams	Oct. 15	William van Dyk, DDS	San Rafael	\$49 member/staff; \$98 nonmember/nonmember staff	3
MID-PENINSULA DENTAL SOCIETY					mpds.org
Practice Management	Oct. 4	Sally McKenzie Management	Palo Alto	\$225 CDA member; \$125 staff	7
MONTEREY BAY DENTAL SOCIETY				mbdsd	entist.com
Focus on Profitability for the Efficient Practice	July 19	Charles Blair, DDS	Monterey	\$250 member; \$115 ADHP; \$350 nonmember	7
Implementation of Dental Sleep Medicine — Snoring and Sleep Apnea Can Be Treated Safely and Effectively	Sept. 13	John Tucker, DMD	Monterey	\$250 member; \$115 ADHP; \$350 nonmember	7
Dentistry as a Beautiful Art: How to Achieve Highly Esthetic and Predictable Direct Anterior and Posterior Composite Restorations	Oct. 18	Jose Ruiz, DDS	Monterey	\$250 member; \$115 ADHP; \$350 nonmember	7
NAPA-SOLANO DENTAL SOCIETY				napasolanodental	society.org
Street Drugs: What Your Patients and Your Kids are NOT Telling You!	Oct. 4	Hal Crossley, DDS, PhD	Napa	\$310	8
Dental Law and Infection Control	Nov. 7	TBD	Fairfield	\$130	5
NORTHERN CALIFORNIA DENTAL SOCIET	Y			ncds	sonline.org
New Technology for Dental Caries	Sept. 13	Brian Novy, DDS	Red Bluff	\$125 member; \$55 ADHP; \$225 nonmember	6
Rejuvenate Your Practice	Oct. 11	Virginia Moore and Debbie Castagna	Red Bluff	\$125 member; \$55 ADHP; \$225 nonmember	5
Endodontic Therapy	Nov. 1	Sergio Kuttler, DDS	Red Bluff	\$125 member; \$55 ADHP; \$225 nonmember	7
ORANGE COUNTY DENTAL SOCIETY					ocds.org
Systemic Perio Where Is the Link?	Sept. 10	Joan Otomo-Corgel, DDS, MPH, FACD	Irvine	\$79	2.5
Transformative Esthetics	Oct.8	Pascal Magne, DMD, PhD	Irvine	\$79	2.5
BLS for the Healthcare Provider	Oct. 16	Helen McCracken, RDS, MS	Orange	\$69	3
Restorative Dentistry Update: Science, Technique and Materials	Nov. 12	Todd R. Schoenbaum, DDS, FAGD, FACD	Irvine	\$79	2.5
OSTROW SCHOOL OF DENTISTRY OF USC	CONTINUES ON NE	XT PAGE		uscde	entalce.org
Clinical Intravenous Sedation	July 12-14, 19-21	Stanley Malamed, DDS, and faculty	Los Angeles	\$12,450 dentist	42
2013 Las Vegas Travel and Learn Program	July 13-14	Bach Le, DDS, MD, FICD, and Baldwin W. Marchack, DDS, MBA	Las Vegas	\$995 dentist	16
Simplifying Anterior Restorations: Problem Solving in the Esthetic Zone (Parts I and II — Lecture and Hands-on Workshop)	July 19-21	Abdi Sameni, DDS	Los Angeles	\$295 dentist; \$225 ADHP	7

ТОРІС	DATE	lecturer(s)	LOCATION	соѕт	UNITS
OSTROW SCHOOL OF DENTISTRY OF USC	CONTINUES ON NE	XT PAGE		uscde	ntalce.org
Simplifying Anterior Restorations: Problem Solving in the Esthetic Zone (Parts I and II — Lecture and Hands-on Workshop)	July 19-21	Abdi Sameni, DDS	Los Angeles	\$1,995 dentist	21
Esthetic Full-mouth Implant Reconstruction: Advanced Prosthodontic Techniques for Challenging Patients (Module I, II and III)	July 26-28	Harel Simon, DMD	Los Angeles	\$1,995 dentist; \$1,695 ADHP	21
Esthetic Full-mouth Implant Reconstruction: Advanced Prosthodontic Techniques for Challenging Patients (Module I)	July 26	Harel Simon, DMD	Los Angeles	\$295 dentist; \$225 ADHP	7
Esthetic Full-mouth Implant Reconstruction: Advanced Prosthodontic Techniques for Challenging Patients (Module II)	July 27	Harel Simon, DMD	Los Angeles	\$295 dentist; \$225 ADHP	7
Esthetic Full-mouth Implant Reconstruction: Advanced Prosthodontic Techniques for Challenging Patients (Module III)	July 28	Harel Simon, DMD	Los Angeles	\$1,695 ADHP	21
Advanced Clinical Dental Hygiene Techniques: Complete Parts I-III	July 26-29	Anna Pattison, RDH, and Donna Smith, BSDH, MSEd	Los Angeles	\$900 dentist	
Advanced Clinical Dental Hygiene Techniques: Part I — Advanced Periodontal Instrumentation (Lecture)	July 26	Anna Pattison, RDH	Los Angeles	\$170 dentist	7
Advanced Clinical Dental Hygiene Techniques: Part II - Advanced Periodontal Instrumentation (Hands-on)	July 27-28	Anna Pattison, RDH, MS, and dental hygiene faculty	Los Angeles	\$700 dentist	14
Advanced Clinical Dental Hygiene Techniques: Part III - Ultrasonics and Perioscopy (Lectures and Hands-on)	July 29	Donna Smith, BSDH, MSEd, and Gayle Myers, BS, RDH	Los Angeles	\$200 dentist	8
The Artistic Dentist: Excellence in Direct Anterior and Posterior Composites	Aug. 2-3	Jose-Luis Ruiz, DDS, FAGD	Los Angeles	\$1,395 dentist; \$795 ADHP	14
39th Annual Review of Continuing Education in Dentistry - Maui, Hawaii	Aug. 5-8	Sillas Duarte Jr., DDS, PhD, and Jin-Ho Phark, DDS	Maui, Hawaii	\$595 dentist	16
New Approaches for Antimicrobial Treatment of Periodontal Disease	Aug. 23	Jørgen Slots, DDS, DMD, PhD, MS, MBA	Los Angeles	\$295 dentist; \$225 ADHP	TBD
Fundamentals of Implant Surgery and Restoration (Course A)	Sept. 6-8, Oct. 12- 13, Nov. 16-17	Homayoun Zadeh, DDS, PhD, and faculty	Los Angeles	\$4,395 dentist; \$2,195 ADHP	TBD
Emerging Diseases, Infection Control and California Dental Practice Act	Sept.14	Joyce Galligan, RN, DDS, and Patricia Galligan, JD, LLM in taxation	Los Angeles	\$4,395 dentist; \$2,195 ADHP	TBD
The Secrets of Guided Bone Regeneration: Hands-on Workshop	Sept.14	Bach Le, DDS, MD, FICD	Los Angeles	\$995 dentist; \$845 ADHP	7
Functional Crown Lengthening Surgery – For Improved and Predictable Restorative Outcomes (Lecture and Hands-on)	Sept. 21	Ziv Simon, DMD, MSc	Los Angeles	\$995 dentist; \$595 ADHP	7
Pain Medications Update for Dentists Treating Chronic Pain and TMD	Sept. 27-28	Glenn Clark, DDS, MS, and faculty	Los Angeles	\$495 dentist; \$385 ADHP	14
The USC Sixth International Restorative Dentistry Symposium	Oct. 4-5	Abdi Sameni, DDS, and national/ international speakers	Los Angeles	\$445 dentist; \$345 ADHP	14

ТОРІС	DATE	LECTURER(S)	LOCATION	COST	UNITS
OSTROW SCHOOL OF DENTISTRY OF USC	CONTINUED			uscde	entalce.org
The USC Sixth Geriatric Dentistry Symposium	Oct. 18-19	Roseann Mulligan, DDS, MS, FADPD, DABSCD, and national/ international speakers	Los Angeles	\$445 dentist; \$345 ADHP	14
Comprehensive Periodontal Surgery: Advanced Training in Functional and Esthetic Soft Tissue Procedures (Pre-course Review)	Oct. 24	Ziv Simon, DMD, MSc	Los Angeles	\$65 dentist	4
Comprehensive Periodontal Surgery: Advanced Training in Functional and Esthetic Soft Tissue Procedures — Modules I, II, III (Complete)	Oct. 24-27	Ziv Simon, DMD, MSc	Los Angeles	\$2,595 dentist	25
Comprehensive Periodontal Surgery: Advanced Training in Functional and Esthetic Soft Tissue Procedures — Module I (Lecture and Hands-on Workshop)	Oct. 25	Ziv Simon, DMD, MSc	Los Angeles	\$985 dentist	7
Comprehensive Periodontal Surgery: Advanced Training in Functional and Esthetic Soft Tissue Procedures — Module II (Lecture and Hands-on Workshop)	Oct. 26	Ziv Simon, DMD, MSc	Los Angeles	\$985 dentist	7
Comprehensive Periodontal Surgery: Advanced Training in Functional and Esthetic Soft Tissue Procedures — Module III (Lecture and Hands-on Workshop)	Oct. 27	Ziv Simon, DMD, MSc	Los Angeles	\$985 dentist	7
Pediatric Oral Sedation Certification Program	Nov. 6-10	Stanley F. Malamed, DDS, and Kenneth Reed, DMD	Los Angeles	\$3,290 dentist; \$645 ADHP	TBD
Esthetic Full-mouth Implant Reconstruction: CAD/CAM Restorations and Computer Guided Technology (Module I, II and III)	Nov. 8-10	Harel Simon, DMD	Los Angeles	\$1,995 dentist; \$1,695 ADHP	21
Esthetic Full-mouth Implant Reconstruction: CAD/CAM Restorations and Computer Guided Technology (Module I)	Nov. 8	Harel Simon, DMD	Los Angeles	\$295 dentist; \$225 ADHP	7
Esthetic Full-mouth Implant Reconstruction: CAD/CAM Restorations and Computer Guided Technology (Module II)	Nov. 9	Harel Simon, DMD	Los Angeles	\$295 dentist; \$225 ADHP	7
Esthetic Full-mouth Implant Reconstruction: CAD/CAM Restorations and Computer Guided Technology (Module III)	Nov. 10	Harel Simon, DMD	Los Angeles	\$1,875 dentist	7
Supra-gingival Dentistry Workshop: Easy, Predictable Porcelain Veneer, Onlays and Full Crowns	Nov. 15-16	Jose-Luis Ruiz, DDS, FAGD, and Boris Keselbrener, DDS	Los Angeles	\$1,895 dentist	14
The USC 12th International Endodontic Symposium	Nov. 22-23	llan Rotstein, DDS, and national/ international speakers	Los Angeles	\$495 dentist; \$375 ADHP	14
Implant Therapy for Edentulous Patients	Dec. 7-8	Homayoun Zadeh, DDS, PhD, and Lyndon Cooper, DDS, PhD	Los Angeles	\$1,495 dentist; \$795 ADHP	16
A Contemporary Approach to Diagnosis, Treatment Planning and Therapy in Periodontics	Dec. 13	Ziv Simon, DMD, MSc, and Ilan Rotstein, DDS	Los Angeles	\$295 dentist; \$195 ADHP	7
Focus on The Maxillary Sinus: Lecture and Cadaver Hands-on Workshop	Dec. 14	Bach Le, DDS, MD, FICD	Los Angeles	\$995 dentist; \$695 ADHP	7

торіс	DATE	LECTURER(S)	LOCATION	соѕт	UNITS
PACIFIC COAST SOCIETY OF ORTHODONT	ISTS CONTINUES OF	N NEXT PAGE			pcsortho.org
Reconsidering the Role of Early Treatment in Orthodontics	Oct. 5	Steven Dugoni, DMD, MSD	Monterey	\$255 for three days	1
Simple Systems for Quality Assurance	Oct. 5	Shiva Shanker, DDS, MS, MDS	Monterey	\$190 for three days	1.5
Think Right, Do Right, Be Right	Oct. 5	Ken Alexander	Monterey	\$190 for three days	1.5
Treatment Planning — The Magic Step	Oct. 5	James Vaden, DDS, MS	Monterey	\$255 for three days	1
Controversies in Orthodontics	Oct.5	Terry McDonald, DDS, MS	Monterey	\$255 for three days	1
Managing Your Stress —How to Relax and Enjoy	Oct. 5	Jerry Teplitz, JD, PLD, CSP	Monterey	\$190 for three days	1.5
3-D Image-aided Treatment of Impacted and Transposed Teeth	Oct. 5	Sunil Kapila, DDS, MS, PhD	Monterey	\$255 for three days	1
Improving Management of Patients with Autism and ADHD	Oct. 5	Heather Whitney Sesma, PhD, LP	Monterey	\$190 for three days	1.5
Innovative Practice Management	Oct. 5	John Pobanz, DDS, MS	Monterey	\$190 for three days	1.5
Create the Future by Looking Back — 100 Years	Oct. 5	David Turpin, DDS, MSD	Monterey	\$190 for three days	1.5
Class II Correction — Diagnosis, Treatment Planning and Treatment Options	Oct. 6	Richard McLaughlin, DDS	Monterey	\$255 for three days	1.5
From My Side of the Chair: Sterilization in Today's Orthodontic Practice	Oct. 6	Andrea Cook	Monterey	\$190 for three days	1.5
Tracking Referral Sources and the Value of Marketing Dollars	Oct. 5	Robert Haeger, DDS, MS	Monterey	\$190 for three days	1.5
Extreme Case Acceptance: Go Big or Go Home!	Oct. 6	Nickole Bradfield	Monterey	\$190 for three days	1.5
Effective Posterior Space Closure With Sliding Mechanics	Oct. 6	Will A. Andrews, DDS	Monterey	\$255 for three days	1
PVS Impressions for Emerging Technologies	Oct. 6	Rita Johnson	Monterey	\$190 for three days	1.5
Google Docs and Cloud Computing in the Office	Oct. 6	Scott V. Law, DMD	Monterey	\$190 for three days	1.5
Accelerated Osteogenic Orthodontics Systems (AOO) — The Physiological Benefits and Increased Range of Movements	Oct. 6	William Wilcko, DDS, MS	Monterey	\$255 for three days	1.5
Clinical Photography: Taking Quality Extraoral and Intraoral Photos	Oct. 6	Rita Bauer	Monterey	\$190 for three days	1.5
Patient Flow Scheduling and Digital Pearls for Efficient Letters and Marketing	Oct. 6	Lynne C. Fales	Monterey	\$190 for three days	1.5
High Quality + High Efficiency = A GREAT Practice!	Oct. 6	Rebecca Poling, DDS, MSD	Monterey	\$190 for three days	1.5
Understanding SEO and Social Media to Attract New Patients	Oct.6	Mary Kay Miller	Monterey	\$190 for three days	1.5
Clinical and Research Applications of Digital Orthodontic Models	Oct.7	Dan Grauer, DDS, MS, PhD	Monterey	\$255 for three days	1
Creating an Elite Orthodontic Office: A Comprehensive Review of How to Increase Case Starts, Brand Your Office and Develop a Reputation	Oct.7	Neal Kravitz, DMD, MS	Monterey	\$190 for three days	1.5
Live Life Smiling: The Practice Playbook of a Doctor, a Team and a Dream	Oct.7	Anil Idiculla, DMD, MS	Monterey	\$190 for three days	1.5
How Successful Is Invisalign for Treatment of Open and Deep Overbite?	Oct.7	Robert L. Boyd, DDS, MEd	Monterey	\$255 for three days	1
DIY Technology Upgrades on a DIY Budget	Oct.7	Steven P. McEvoy	Monterey	\$190 for three days	1.5

торіс	DATE	LECTURER(S)	LOCATION	COST	UNITS
PACIFIC COAST SOCIETY OF ORTHODONT	ISTS CONTINUED			рс	sortho.org
3-D Imagery	Oct.8	Aaron Molen, DDS, MS	Carmel	\$325 for two days	3
Class III Treatment: What Works, What Doesn't	Oct. 9	Peter Ngan	Carmel	\$325 for two days	3
SACRAMENTO DISTRICT DENTAL SOCIETY	(sdds.org
CPR BLS for the Healthcare Provider Renewal Course	Aug. 3, Nov. 2	SDDS Instructors	Sacramento	\$65	4
Dental Sleep Medicine — The Dentist's Role in Airway Management	Sept. 10	Mark Abramson, DDS	Sacramento	visit sdds.org	3
Do You Trust Your Trust?	Sept. 19	Mark Drobny, Esq.	Sacramento	visit sdds.org	0
CAD-CAM Dentures: Computer-aided Design, Computer-aided Manufacture	Oct.8	Mark Dellinges, DDS, FACP	Sacramento	\$60	3
How to Manage Endodontic Failures	Oct. 11	M. Sadegh Namazikhah, DMD	Sacramento	visit sdds.org	5
Adult Oral Sedation — Introduction, Update and Permit Renewal	Oct. 25	Anthony Feck, DMD	Sacramento	visit sdds.org	7
Information Privacy and Security Update: HITECH and CMIA	Nov. 12	Teresa Pichay	Sacramento	\$60	3
SAN DIEGO COUNTY DENTAL SOCIETY					sdcds.org
CPR Renewal Course	July 11	Daniel Jurman	San Diego	\$25 members; \$40 staff	3
Botox in Dentistry	Aug. 29	TBA	San Diego	\$99 members; \$125 staff	3
OSHA, Infection Control and Dental Practice Act	Oct. 4	ТВА	San Diego	\$50	4
CPR Renewal Course	Oct. 11	Daniel Jurman	San Diego	\$25 members; \$40 staff	3
SAN FERNANDO VALLEY DENTAL SOCIET	Y				sfvds.org
Esthetic Implant Dentistry	Sept. 18	Saj Jivraj, DDS	Van Nuys	\$150	7
Restorative Materials: Is There a Difference or Are They All the Same?	Oct. 16	Charles Wakefield, DDS	Van Nuys	\$150	7
SAN FRANCISCO DENTAL SOCIETY					sfds.org
CPR Renewal	Aug. 28	Adrian Curry, EMT	San Francisco	\$65 (plus \$12 for required CPR book)	4
Dental Practice Emergency Preparedness and Disaster Planning	Sept. 11	Adrian Curry, EMT; Fredric Warren, DDS, MSD; Deborah Elam, MSE	San Francisco	\$109	4
Infection Control/Bloodborne Pathogens/ HazCom Refreshers	Sept. 27	Marcella Oster, RDA	San Francisco	\$95	4
California Dental Practice Act	Sept. 27	Marcella Oster, RDA	San Francisco	\$60	2
CPR Basic Life Saving	Sept. 28	Adrian Curry, EMT	San Francisco	\$95 (plus \$12 for required CPR book)	4
General Membership CE Meeting — Bone Grafting Update for the General Practitioner	Oct. 17	Edmond Bedrossian, DDS	San Francisco	\$74	2
CPR Renewal	Oct. 30	Adrian Curry, EMT	San Francisco	\$65 (plus \$12 for required CPR book)	4
CPR Renewal	Nov. 20	Adrian Curry, EMT	San Francisco	\$65 (plus \$12 for required CPR book)	4
Infection Control/Bloodborne Pathogens/ HazCom Refreshers	Nov. 22	Marcella Oster, RDA	San Francisco	\$95	4
California Dental Practice Act	Nov. 22	Marcella Oster, RDA	San Francisco	\$60	2
Annual Installation and Meeting — Topic TBA	Dec. 5	ТВА	San Francisco	\$74	2

ТОРІС	DATE	LECTURER(S)	LOCATION	COST	UNITS	
SAN GABRIEL VALLEY DENTAL SOCIETY					sgvds.org	
Inter-implant Papilla Management in the Esthetic Zone	Sept. 17	Joseph Kan, DDS, MS	Alhambra	\$65 member; \$100 nonmember	3	
What the Oral Sedation Courses Don't Tell You	Oct. 15	Laura Matsunaga, DDS	Alhambra	\$65 member; \$100 nonmember	3	
Attitudes in the Workplace	Nov. 19	Mari Bradford, CEA	Alhambra	\$65 member; \$100 nonmember	3	
SAN JOAQUIN DENTAL SOCIETY					sjds.org	
Safe Strategies for Managing Dental Insurance Companies	Sept. 17	Michael Perry, DDS	Stockton	TBD	2	
California Dental Practice Act/Infection Control	Nov. 21	Leslie Canham, CDA, RDA	Stockton	TBD	4	
SANTA BARBARA VENTURA COUNTY DEN	ITAL SOCIETY				sbvcds.org	
Infection Control and Dental Practice Act	July 19	Jason Wood and Noel Kelsch	Goleta	\$150	4	
Twenty-first Century Laser-assisted Dentistry — Lecture and Workshop	Sept. 27	Rick Cardoza, DDS	Oxnard	\$185	7	
Minimally Invasive Restorative Dentistry	Oct. 18	Raymond L. Bertolotti, DDS, PhD	Oxnard	\$185	7	
Offensive Dentistry and Get your Hands on another Restorative Technique — 2-part Lecture	Nov. 22	Brian Novy, DDS	Oxnard	\$185	7	
SANTA CLARA COUNTY DENTAL SOCIETY					sccds.org	
Periodontics/TBA	Sept. 12	Gian Pietro Schincaglia, DDS, PhD	Campbell	\$35 for non-SCCDS member	2	
Endo/TBA	Oct. 10	Alan Gluskin, DDS	Campbell	\$35 for non-SCCDS member	2	
Essential Esthetic Dentistry	Oct. 11	Bruce Crispin, DDS, MS	Campbell	\$219 member; \$119 staff before Sept. 1	6	
Orthodontics/TBA	Nov. 14	Straty Righellis, DDS	Campbell	\$35 for non-SCCDS member	2	
ТВА	Dec. 12	ТВА	Campbell	\$35 for non-SCCDS member	2	
SOUTHERN CALIFORNIA ACADEMY OF GENERAL DENTISTRY 310.471.4916						
Botox Therapy for Dental Practice	Sept. 15	Andrew Blumenfeld, MD	Garden Grove	\$195 AGD member; \$275 non-AGD members	8	
Minimally Invasive Restorative Dentistry	Dec. 8	Brian Novy, DDS	Garden Grove	\$225 AGD member; \$275 non-AGD members	8	
TRI-COUNTY DENTAL SOCIETY					tcds.org	
OSHA	Sept. 19	Kathleen Lewand	Riverside	\$65 member; \$75 non- member; save \$20 if registered by Sept. 2	TBD	
Defensive Practice Management: Managing Patients and Parents	Nov. 14	Katie Fornelli	Riverside	\$65 member; \$75 non- member; save \$20 if registered by Nov. 1	2	
UCLA SCHOOL OF DENTISTRY CONTINUE	S ON NEXT PAGE		de	ntistry.ucla.edu/continuing	education	
UCLA Hawaii 2013: Esthetic Dentistry and Periodontics	July 1-5	Bob Margeas, DDS, and Scott Keith, DDS, MS	Grand Wailea Resort, Maui, Hawaii	\$798 dentist; \$398 hygienist; \$298 ADHP	24	
Aesthetic Continuum	July 18-21, Aug. 22- 25, Sept. 19-22	Jimmy Eubank, DDS, and Jeff Morley, DDS	Los Angeles	\$6,995	90	
Registered Dental Assistants in Extended Functions II — Module 1	July 13-14, 27-28, Aug. 10-11, 24-25	Richard Stevenson, DDS	Los Angeles	\$3,995	96	

торіс	DATE	lecturer(s)	LOCATION	COST	UNITS		
UCLA SCHOOL OF DENTISTRY CONTINUED dentistry.ucla.edu/continuing-education							
Sleep Medicine Mini-residency	Aug. 2-3, Sept. 6-7, Oct. 4-5, Nov. 1-2, Dec. 6-7	Robert Merrill, DDS, MS, and Dennis Bailey, DDS	Los Angeles	\$5,995	60		
TMD/OFP Mini-residency	Aug. 8-9, Sept. 13- 14, Oct. 11-12, Nov. 8-9, Dec. 13-14	Robert Merrill, DDS, MS	Los Angeles	\$3,950	68		
Registered Dental Assistants in Extended Functions II — Module 2	Sept. 7-8, 21-22, Oct. 5-6, 19-20, Nov. 2-3, 16-17, 23- 24, Dec. 7-8	Richard Stevenson, DDS	Los Angeles	\$4,995	128		
Dentoalveolar Surgery	Sept.7	Earl Freymiller, DMD, MD, and Alan Felsenfeld, DDS	Los Angeles	\$198 dentist; \$98 ADHP	7		
Pit and Fissure Sealants	Sept. 21, 22	Cara Batson, RDA, and Charlene Flowers, RDA	Los Angeles	\$250	8		
Dental Ethics for a Changing Profession	Sept. 28	Gary Herman, DDS	Los Angeles	\$198	7		
Complete Dentures	Oct. 5	Eleni Roumanas, DDS, and Kumar Shah, BDS	Los Angeles	\$198	7		
Recent Advances in Detection and Management of Oral Pre-cancer Lesions	Oct. 5	Diana V. Messadi, DDS, MMSc, DMSc	Los Angeles	\$135	4		
California Dental Practice Act and Infection Control	Oct. 19	Andy Wong, DDS	Los Angeles	\$135 dentist; \$98 ADHP	4		
Practical Occlusion for Esthetics and Function	Oct. 18, 19, 20	Jimmy Eubank, DDS; Todd Schoenbaum, DDS; Phil Kroll, DDS	Los Angeles	\$4,495	21		
9th Annual Endodontic Distinguished Lecture Series	Oct. 26	Gary Carr, DDS, and Marcus Haapasao, DDS, PhD	Los Angeles	\$295	7		
Certification in Pediatric Oral Sedation	Oct. 31, Nov. 1, 2	Christine Quinn, DDS, MS, and Steven Ganzberg, DMD, M	Los Angeles	\$2,995	26		
Recertification in Pediatric Oral Sedation	Nov. 2	Christine Quinn, DDS, MS, and Steven Ganzberg, DMD, MS	Los Angeles	\$295	8		
HIV Infection: An Update	Nov. 2	Fariba S. Younai	Los Angeles	\$198 dentist; \$98 ADHP	7		
Your Patient's Medical History: What You Don't Know Can Hurt You	Nov. 9	Earl Freymiller, DMD, MD, and Alan Felsenfeld, DDS	Los Angeles	\$298 dentist; \$98 ADHP	7		
Infection Control for RDA's	Nov. 9	Charlene Flowers, RDA	Los Angeles	\$250	8		
The Diagnostic Box: Esthetics, Occlusion, Comprehensive Care	Nov. 15, 16, 17	Jimmy Eubank, DDS, and Todd Schoenbaum, DDS	Los Angeles	\$3,995	24		
Interpersonal Skills and Clinical Psychology	Nov. 16	Craig Woods, DDS, MA	Los Angeles	\$198 dentist; \$98 ADHP	7		
Periodontal Surgery Workshop	Nov. 23, 24	Paulo Camargo, DDS, MS, and Philip R. Melnick, DMD	Los Angeles	\$898 early registration, \$998 after Nov. 4	16		
UCSF FRESNO CAMPUS fresno.ucsf.edu/continuing_ed							
Contemporary Restorative Trends	July 19	Dan Ward, DDS	Fresno	\$160 dentist; \$134 RDH, CDT \$114 RDA; \$101 resident	7		
Building Your Practice by Creating Predictable Biomimetic, Minimally Invasive Restorations	Sept. 20	Mark Malterud, DDS	Fresno	\$160 dentist; \$134 RDH, CDT; \$114 RDA; \$101 resident	7		
Direct Restorations in the Contemporary Esthetic Practice	Aug. 23	Faroud Hakim, DDS	Fresno	\$160 dentist; \$134 RDH, CDT; \$114 RDA; \$101 resident	7		
Designed for Accomplishment, Engineered for Success	Oct. 18	Tim Bizga, DDS	Fresno	\$160 dentist; \$134 RDH, CDT; \$114 RDA; \$101 resident	7		
OSHA Review and Infection Control	Nov. 8	Morgan Lawson	Fresno	\$117 dentist; \$112 RDH, CDT; \$102 RDA; \$87 resident	4		

ТОРІС	DATE	LECTURER(S)	LOCATION	соѕт	UNITS		
UNIVERSITY OF CALIFORNIA SAN FRANCISCO dentistry.ucsf.edu/cde							
Invisalign	July 7	Gerald Nelson, DDS	San Francisco	ТВА	7		
Implant Dentistry in the Digital World	Sept. 7-8	Arun Sharma, BDS, MS, and Richard Kao, DDS, PhD	San Francisco	TBA	14		
Caries Management by Risk Assessment —Implementation in Your Dental Practice	Oct. 4-5	John D.B. Featherstone, MSc, PhD	Yosemite, Tenaya Lodge	\$325 dentist; \$275 ADHP	8		
Adhesive Restorative Materials	Oct. 19	Edmond R. Hewlett, DDS	San Francisco	TBA	7		
Street Drugs	Dec. 6	Harold L. Crossley, DDS, PhD	San Francisco	ТВА	7		
WESTERN LOS ANGELES DENTAL SOCIETY westernlads.org							
The Digital Dental Office: Computer Assisted Prosthodontics	Sept. 24	David L. Guichet, DDS	Culver City	\$75 ADA member dentist; \$120 nonmember dentist; \$60 non dentist	3		
Endodontics for the General Practitioner	Dec.7	Nestor Cohenca, DDS	Culver City	\$195 ADA member dentist; \$225 nonmember dentist; \$95 non dentist	6		
YOSEMITE DENTAL SOCIETY yosemiteds.com							
Part II — Fixed Prosthesis and Comprehensive Periodontics	Sept. 6	Ranu Mishra, DDS, and Israel Trujillo, DDS	Merced	\$125 dentist; \$100 staff	8		

100% silk neckties. 100% cotton onesies. 100% CDA. cda.org/store

The CDA Store is now online. Be it insulated tumblers, colorful tote bags, "smartdentist" T-shirts, or digital screen cleaners, go to **cda.org/store** and take home a stylish piece of CDA today.



Specializing in the Selling and Appraising of Dental Practices

PRACTICE SALES INC.



Serving California Since 1974

"Your local Southern California Broker"

Phone: (714) 639-2775 (800) 697-5656 Fax: (714) 771-1346 Email: jknipf@aol.com rpalumbo@calpracticesales.com WWW.CALPRACTICESALES.COM



John Knipf & Robert Palumbo

LOS ANGELES COUNTY

BURBANK (Ortho) - 45 yrs gdwll. Consists of 2 chairs in open bay w/ Pano/Ceph in 1,221 sqft ste. Grossed ~\$292K in 2012.ID #4047. CULVER CITY - Leasehold & Equip Only! 10 eq op office in a single story bld. In residential area. Heavy traffic flow. ID #4261. HUNTINGTON PARK (GP) Established in 2008. In a 2 story free stranding bldg near residential area. Has 4 eq ops. ID#4295. LONG BEACH (Ortho) - 46 yrs of goodwill. Located in a 3 story medical bldg. 4 chairs in open bay. In residential area. ID # 4255. LONG BEACH (Ortho) - Three practices as one entity. Have approx. 300 active patients. Has over 50 yrs of goodwill. ID#4285. N. HOLLYWOOD (GP/ORTHO) -Over 14 years of goodwill located in Prof. Bldg. Consists of 4 ops. Monthly revenues ~\$32K. ID#4265. TARZANA (GP) - Fee for service practice w/ over 28 yrs of goodwill. Consists of 8 eq ops and 2 plmbd not eq. ID #4313. SANTA MONICA (GP) - Fee for service practice located in 4 story med/dent bldg with over 30 years of goodwill. ID #4297. SOLD VALENCIA - Leasehold Improvements Only! Beautiful office w/ 6 plmbd not eq ops in 2,400 sqft. suite. Busy shopping center. ID#4321.

ORANGE COUNTY

HUNTINGTON BEACH (GP) - Modern designed practice w/3 eq ops & 1 plmbd in a 1,280 sqft ste. Grossed \$246K in 2012. ID #4317. HUNTINGTON BEACH (GP) Located in a 2 story prof bldg w/ 3 eq fully eq ops, Dentrix software in a 1,650 sqft ste. ID # 4327. LAKE FOREST (GP) - Turn key practice w/3 spacious eq ops, 1 plmbd not eq in a 1,200 sq ft ste. Busy shopping center. ID #4123. MISSION VIEGO (GP) - Well designed turn-key practice w/ 3 eq op & 3 plmbd is located in a prestigious shopping center. ID #4303. RANCHO STA MARGARITA (GP) State of the art office in 2 story plaza center. Has 7 fully eq ops. NET \$242K. ID #4187. NEWPORT BEACH - Leasehold & Equip Only! On a 2 story med/dent bldg w/ 3 eq ops in a 1,000 sq ft suite. Reasonable rent. ID#4325. TUSTIN - Leasehold & Equip Only! Beautiful state-of-the-art off. Great for GP or Spec. 5 eq ops/3 plmbd not eq for expansion. ID #4225.

RIVERSIDE / SAN BERNARDINO COUNTIES

APPLE VALLEY (GP) - Established in 2007 this modern designed office is in a busy shopping center. Net of \$384K. ID #4271. BARSTOW(GP) - Long established office w/ 4 eq ops in a single story bldg. Easy freeway access. Fee for service. ID #4241 FONTANA (PEDO) - State-of-the-Art office w/ 2fully eq ops & 3 chairs in open Bay. 15% Insurance & 85% Denti-cal. ID #4301. LA QUINTA - Price Reduced. Leasehold & Equip Only! Located in strip shopping center W/3 eq. ops, 1,000 sq. ft. ste.ID#4063 SOLD MURRIETA (GP) - Beautiful office w/3 eq ops surrounded by major anchor tenants. Some Capitation. 4 day/wk office. ID #4247. PALM DESERT (GP) - Well established practice w/ 5 eq ops in 1 story bldg w/ ample parking & excellent signage. Net \$119K. ID#4331. SUN CITY (GP) -Long established office w/ 2 eq ops, 1 plumbed not eq room for expansion in a 4 suite medical/dental bldg. ID #4287. UPLAND - Leasehold & Equip Only! All active pt charts included. Located in 2 story med bldg (ground level) w/ 3 eq ops. ID #4323.

SAN DIEGO C OUNTY

ENCINITAS (GP) - Corner location w/ excellent signage and street visibility. Consists of 2 eq ops. Fee for service. ID # 4315. RAMONA (GP) - Established in 1979 and located in single strip mall. Busy area. Fee for service. Consists of 3 eq op. ID #4305. SAN DIEGO (GP) - In free standing bldg w/ private prkng. Consists of 5 ops w/ Dentrix software. Monthly revenues of ~\$40K. ID #4279. SAN DIEGO (GP) - Beautiful Turn-Key practice with 8 eq ops in a modern designed shopping center. Absentee owner. ID #4335.

VENTURA & SANTA BARBARA COUNTY

SANTA BARBARA (GP) - Well established practice in busy shopping center w/3 eq ops in a 1,220 sq ft suite. ID #4311.

http://www.calpracticesales.com/blog

Call us about Debt Consolidation & Retirement Planning VISIT OUR WEBSITE WWW.CALPRACTICESALES.COM CA DRE#00491323

John Knipf President W Kniff (Neff)

Also serving you: Robert Palumbo, Executive V. P. /Partner, Alice C. King, V.P., Greg Beamer, V.P., Tina Ochoa, V.P., & Maria Silva, V.P.
Classifieds

How to Place a Free Classified Ad

The Journal has changed its classified advertising policy for CDA members to place free classified ads online and publish in the Journal. Only CDA members can place classified ads. Non-CDA members can place display ads.

All classified ads must submitted through cda.org/classifieds. Fill out the blank fields provided, including whether the ad is to appear online only or online and in the Journal. Click "post" to submit your ad in its final form. The ad will post immediately on cda.org and will remain for 90 days. Space permitting, your ad will run one time in the next issue of the Journal following the posting of your online ad. After 90 days, you will need to repost your ad if you wish to continue running it online.

Classified ads for publication in the Journal must be submitted by the fifth of every month, prior to the month of publication. Example: Jan. 5 at 5 p.m. is the deadline for the February issue of the *Journal*. If the fifth falls on a weekend or holiday, then the deadline will be 5 p.m. the following workday. After the deadline closes, classified ads for the *Journal* will not be accepted, altered or canceled. Deadlines are firm.

Classified advertisements categories are: Equipment for Sale, Offices for Sale, Offices for Rent or Lease, Available Positions, Opportunities Wanted, and Practices for Sale.

How to Place a Display Ad

Nonmembers are welcome to place display ads. For information on display advertising, please contact Corey Gerhard at 916-554-5304 or corey.gerhard@cda.org.

CDA reserves the right to edit copy and does not assume liability for contents of classified advertising.

AVAILABLE POSITIONS

BACK ASSISTANT — Looking for an experienced Dental Assistant with at least 1 year of experience, needs to know how to do quality X-rays, make temporary crowns and all aspects of dentistry. Private practice Monday through Friday, no weekends. Do not apply if you don't have experience. Email Kristi at kristi2330@aol.com.

ASSOCIATE DENTIST — Private General Practice in beautiful Windsor, Sonoma County, is seeking an Associate Dentist. Long-term, stable employment with possibility of leading into partnership. 2-plus years of experience preferred. Please email resume to Barbara at barbara@windsordentist.com. **DENTIST** — Part-time Dentist needed for community clinic. Candidate must have at least 3 years experience, excellent chairside manner and strong focus on providing quality care. For faster reply, please email resume to asung@evchc.org or call 626.919.5724, x2300.

ASSOCIATE DENTIST — Western Dental Associate Dentist's primary duties include the diagnosis, treatment and prevention of conditions of the teeth, soft mouth tissues and the oral cavity. Associate Dentists examine patients, review X-rays, remove tooth decay, place restorations, perform extractions, repair fractured teeth and provide other common dental

CONTINUES ON 446

When Looking to Invest in Professional Dental Space Dental Professionals Choose



Linda Brown

30 Years of Experience Serving the Dental Community Proven Record of Performance

- Dental Office Leasing and Sales
- •Investment Properties
- Owner/User Properties
- Locations Throughout Southern California

For your next move, Contact Linda Brown: Direct Line: (818) 466-0221 Fax: (818) 593-3850 E-mail: LindaB@TOLD.com website: www.TOLD.com CA DRE #: 01465757



CLASSIFIEDS, CONTINUED FROM 445

treatments. Associate Dentists may perform minor oral surgery procedures and fabricate/place dentures to replace missing teeth. They provide instruction on diet, brushing, flossing and other aspects of oral health. Primary advantages of being a Western Dental Dentist: Training and oversight by a robust quality assurance program. Ongoing one-on-one mentoring and counseling from highly experienced dentists. Company-provided continuing education courses on a variety of dental topics from nationally renowned dentists. State-of-the-art dental facilities, equipment and supplies. A steady flow of patients and the best practice management support system in the industry. Competitive salary programs. Key responsibilities: Examine, diagnose and provide dental treatment to Western Dental patients. Use a variety of modern dental instruments including hand tools, rotary instruments and digital radiograph. Ensure all OSHA, Dental Board and WDS policies and procedures are properly followed. Maintain proper patient treatment records. Provide oral hygiene instructions patients. Provide dental services of the quality required by Western Dental's Quality Management Department. Ability to build good rapport with patients and staff. Provide excellent chair-side communication to enhance the patient experience. Contact Branden Schoedl, doctor recruiter at 714.571.6413 or email bschoedl@ westerndental.com.

DENTIST — We are looking for an Associate Dentist to join our dental practice. Please send resume and picture via email to dmengdds@gmail.com.

DENTIST — Part-time Dentist in great San Carlos office. Our office is looking for a Dentist with 1-plus years of experience to work Mondays and Wednesdays from 9 a.m. to 5 p.m. We are a sole-practitioner office with daily hygiene and we go out of our way to take great care of our patients. You must be a team player with a good sense of humor and be willing to go the extra mile for your patients. Experience in Endodontics or Oral Surgery is a plus. We prefer a long-term relationship with someone who will be open, honest and trustworthy. A Dentist who is willing to do marketing and bring new patients to the practice is a bonus. Please email your resume with a cover letter in an MS Word document, Please contact Ellen at 650.591.0995 or email her at Ellen@ sancarlosdds.com to set up an interview.

DENTIST — We are looking for a qualified Dentist who is comfortable performing all aspects of general dentistry, including molar RCTs and extractions. Strong diagnosis skills required. Prefer an outgoing and energetic Dentist who is comfortable working out of 3 to 4 operatories at a time. Must be good with children, as this is a family practice. This will be a permanent position on Mondays and Tuesdays, with the possibility of adding more days, as the owner is planning on retiring. Please fax resume to 760.951.8811. Please do not fax a resume if you are not a General Dentist.

DENTIST — Our family practice has been established for more than 20 years. We have excellent supporting staff. We are looking for a Dentist with a minimum of 3 years experience. Must have excellent rapport with patients. We have our own Surgeon, Endodontist, Periodontist and Orthodontist. Most procedures done by General Dentist are crowns and bridges, cosmetic restorations, removable prosthetics and implants. Please email resumes to gilbertlim@msn.com.

DENTIST — Full-time position for multispecialty office. Experience working in an HMO multispecialty office. Please email CV to sdpartners346@yahoo.com.

DENTIST — Want to own you own practice? Progressive, successful dental office seeking an Associate who desires to change patients' lives with exceptional dentistry. Must have excellent people skills and a very high level of integrity. Join our patient-oriented team and enjoy practicing in a warm and inviting office. This will lead to practice ownership. Please email CV to ddscarole@yahoo.com.

DENTIST — Great part-time opportunity. We are in need of a Dentist for Thursdays and Fridays for our established general practice in Windsor, Calif. May lead to more days and possible partnership. Please send resume/CV for immediate consideration to barbara@windsordentist. com.

DENTIST — Top-of-the-line PPO dental office looking for a full-time Dentist. Well-paid position. Partnership possible in the future if motivated. Must have current Calif. license, malpractice insurance, ability to learn and adapt quickly, ability to lead staff and motivation to succeed Compensation based on experience and level of motivation. Please email resume to sylvaniayu@gmail.com.



WESTERN PRACTICE SALES 800.641.4179

WPS@SUCCEED.NET | WESTERNPRACTICESALES.COM Practice Transitions Made Perfect TM

BAY AREA

BAY AREA CONTINUED

AC-141 DALY CITY Facility: Close to Serramonte Shp Ctr. 950 sf w/ 3 ops REDUCED! Now \$98k AG-125 SAN FRANCISCO: Relaxed schedule (weekends only) Professional building, major thoroughfare, highly desirable area. 1,000 sf w/2 ops. Plumbed for 1 add'l \$125k

B-9851 SAN RAMON Facility: This opportunity will not wait! Office ~ 1,700 sf w/ 3+ ops **\$219k BC-162 PLEASANT HILL Facility:** Updated office, large windows & views of the outdoors. Open floor plan. 1,852 sf w/6 ops **\$200k**

BC-174 DOWNTOWN HAYWARD: Large & Stable. Off major thoroughfare in residential area. 1,500 sf w/4 ops **\$200k**

BC-175 EAST CONTRA COSTA: Vast employment, shopping and recreational activities! 1,995 sf w/5ops **\$300k**

<u>BG-160 SAN PABLO:</u> Nicest, safest neighborhood in town! Real Estate may be available in future. Single Story Free-standing bldg. 2,875 sf w/7 ops +1 **\$345k**

<u>CC-056 MARIN CC:</u> Beautiful garden setting. Easy access to Hwy 101. 1,200 sf w/ 3 ops. Room for 2 add'l **\$350k**

<u>CC-077 BENICIA:</u> Highly visible. Within walking distance of downtown. 820 sf w/2 ops **\$100k**

<u>CC-118 VACAVILLE Facility:</u> Highly visible, easily accessible. Ample parking. Growing city. 859 sf w/3 ops. Suite Lease/Purchase option **\$245k**

<u>CC-133 SANTA ROSA:</u> Stable patient base. Wellrespected. Location = new patient traffic. Excellent signage/major thoroughfare. 1,291 sf w/3 ops + 1 add'l **\$480k**

<u>CC-151 SANTA ROSA</u>: Stable patient base, wellrespected, close to Memorial Hospital. 2,262 sf w/ 6 ops **\$875k** *Real Estate avail*.

<u>CC-170 SOLANO COUNTY</u>: Minutes from nearby wine country! 950 sf w/3 ops **\$225k**

<u>CN-158 PETALUMA:</u> Predominantly Capitation practice. ~1,000 sf w/ 4 ops **\$450k**

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

DC-113 MILPITAS: Seller retiring! Great location 1,009 sf w/ 3 ops. Plumbed for 1 add'l **\$140k**

DC-164 WATSONVILLE: Shopping complex/main thoroughfare. Modern & Attractive. 2,365 sf w/ 6 ops \$395k

DG-116 SALINAS AREA: Large, loyal, stable patient base. Popular Retail Center. 1,400 sf w/5ops. State-of-the-art Equipment **\$245k**

DG-124 MILPITAS: Highly visible. Desirable area. 960 sf w/ 2 ops + 1 add'l **\$130k**

DG-138 MONTEREY: Centrally located in "New Monterey". Charming office. Excellent street exposure! 1,200 sf w/ 4 ops NOW ONLY \$620k

DG-147 SANTA CLARA Facility: Popular anchor stores/Rtl Shp Ctr. Street-level presence. High foot traffic. 1,500 sf w/ 3 ops + 2 add'l **\$185k**

DG-156 SAN JOSE: Hardwood Floors, Glass Doors & plenty of windows! 1,160 sf w/ 3 ops (+2 add'l) \$165k

DG-161 FREMONT: Open less than a year! Beautiful office generating 40+ new pts/mo. 1,440 sf w/ 4 ops **\$215k**

DN-084 PALO ALTO Facility: Drawing from an educated, upper middle class community. "Move-in" ready! 700 sf w/3 ops **\$125k**

DN-099 SAN JOSE Facility: Ultra-modern facility. Well-established. Dental Professional Complex. 1,450 sf w/5 ops **\$99k**

DN-153 SAN JOSE: Est. 40 yrs. Lg, stable pt base. Seasoned Staff w/ strong skills. Runs like a dream! 2,200 sf w/ 5 fully ops. Includes Cerec \$750k (Real Estate \$950k)

NORTHERN CALIFORNIA

EN-145 ROCKLIN Facility: Very desirable community! ~1,400 sf w/3ops +1 add'l \$150k EN-167 SACRAMENTO: One of the most desirable, affluent areas. 2,400 sf w/5 ops. \$450k F-1013 FORTUNA: Well respected FFS GP. Loyal stable patient base. 1,000 sf w/ 3 ops \$150k FN-087 LAKE COUNTY: Quality practice w/ friendly staff! ~2,400 sf w/ 3+ ops \$775k FN-088 SISKIYOU CO: Family Friendly Location. ~1,300 sf w/ 2 ops \$85k /Real Estate: TBD FN-148 MENDOCINO CO: "Gateway to the Redwoods!" Quality care in 4 ops \$325k GG-140 CHICO VICINITY: Selling less then 50%

of gross! Multi-Generational w/ "Small-Town" feel. 1,200 sf w/4ops **\$248k**

GN-058 YUBA CITY: Known for quality dental care. 1,704 sf w/ 4 ops Reduced! \$359k

<u>GN-103 CHICO:</u> Successful, highly esteemed practice! ~3,500 sf w/ 8 ops + 2 add'l **\$850k** <u>GN-134 REDDING:</u> Stellar reputation, quality care and location! ~2,264 sf w/4 ops. **\$500k** <u>GN-149 YREKA</u>: Quality FFS, Warm & Caring. ~900 sf w/ 3 ops **\$200k/Real Estate \$110k** <u>GN-166 CHICO:</u> Well Respected Practice, loyal patient base. ~1,800 sf w/4 ops. **\$495 w/Cerec!** <u>GN-177 CHICO/OROVILLE</u>: Spacious and spectacu-

GN-177 CHICO/OROVILLE: Spacious and spectace lar! 2,500 sf w/6 ops \$399k

CENTRAL VALLEY

HG-159 S. LAKE TAHOE: Retail Center w/ spectacular views of the lake from each Op. 2,000 sf w/ 5 ops \$590k

CENTRAL VALLEY CONTINUED

HN-059 LASSEN CO: Quality, well-established, family-oriented. 1,600 sf w/3 ops **\$120k**

HN-169 SONORA AREA: Nestled in the pines East of Sonora. Value-oriented patient base. ~1,800 sf w/3 ops + 1 Add'l \$250k

<u>I-9721 STOCKTON:</u> Prof. complex . 1,450 sf w/ 3 ops & plumbed for 1 add'l **\$75k**

IG-067 STOCKTON: Fully computerized, paperless, digitalized. 5,000 sf w/10 ops Now \$425k

IG-081 TURLOCK Facility: Highly visible intersection. 1,512 sf w/5 ops. Oppty to Buy Condo Also! Practice: \$50k

IG-165 TURLOCK: Well established Shared/Solo Group Practice, offering quality care. 10 ops (shared) \$428k

IN-135 GREATER MERCED: Major thoroughfare/ Prof Corridor. 1,300 sf w/ 3 ops REDUCED! \$350k IN-176 TURLOCK: Mother Lode, SF Bay & Sierras nearby! 2,500 sf w/3 ops \$120k

J-1000 TULARE: Highly visible location! ~1,650 sf w/4 ops \$465k /Real Estate: \$249k

JG-136 FRESNO Facility & Real Estate: Highly visible, free-standing Professional building on major thoroughfare. 5,000 sf w/9 ops \$475k

JG-137 FRESNO: Own the Building too! 3,500 sf w/ 5ops Now Only!\$ 425k/ Real Estate \$350k JN-157 FRESNO: Comprehensive care and comfort . 1,470 sf w/3 ops \$200k

<u>JC-178 SAN JOAQUIN VALLEY:</u> Upcoming! Call for Information!

SPECIALTY PRACTICES

AC-119 MILL VALLEY Prostho: Near downtown. Recently remodeled! State-of-the-art equipment including: digital charting and x-ray. 1,100 sf w/ 3 ops. Plumbed for 4th \$450k CG-105 VACAVILLE Ortho: Strong, loyal, widespread referral base. 30+ pats/day. 5-6 new starts/mo. 2,000 sf - 4 chairs/bays \$280k EG-131 ROSEVILLE/AUBURN Ortho: 2 practices within ½ hour of each other! Call for all the details on both locations! \$175k I-7861 CENTRAL VALLEY Ortho: 2,000 sf, open bay w/ 8 chairs. Fee-for-Service. \$370k I-9461 CENTRAL VALLEY Ortho: 1,650 sf w/5 chairs/bays & plumbed for 2 add'I \$180k

IC-163 CENTRAL VALLEY Perio: Coming Soon! Call for info.





"The professionalism that you and your staff demonstrated was always reassuring. You had answers to every question that arose during the process of the sale and guided me and my buyer through each step."

> John Buckton, DDS (sale closed April, 2013)

Considering selling your practice?

We offer professional guidance through the whole process.

We have been handling dentists' practices with care since 1997.

It's what we do!

Dental Practice: Sales - Acquisitions - Mergers - Valuations

Practices recently available in:

- •N San Diego County (Pending)
- •OrcsoLD! ounty Ortho
- •San **SOLD** Jin Valley
- •Downtown LA (*Pending*)
- LA Civic Center Area
- •Reno, NV
- NW Las Vegas, NV (Pending)
- NE Las Vegas, NV (Pending)





CA Representative

888.789.1085

Owner



CONTINUES ON 450

CLASSIFIEDS, CONTINUED FROM 446

DENTAL ASSISTANT — Upscale, growing dental practice is looking for part-time, experienced DA/RDA to handle appropriate duties. We have a paperless office so must be quick with computers. Basic knowledge of front desk duties is very helpful. Knowledge of digital X-rays is a plus! Minimum 3 years experience required. Must be friendly, outgoing and energetic. Tuesdays, Thursdays and some Saturdays. Interviews will be on Thursdays and Saturdays between 2:30 and 7 p.m. Please email your resume to dentexdentalca@vahoo.com.

DENTAL ASSISTANT — Private

Huntington Beach office is looking for a Dental Assistant who is cross-trained in both front and back. Front office duties include answering phones, scheduling appointments, verifying insurance, as well as some treatment planning. Salary negotiable depending on experience and knowledge. Must have good work ethic, dependable, friendly and a team player. Fax resume to 714.377.2299.

DENTAL HYGIENIST — Experienced Hygienist needed for a specialty dental office located in Culver City. While our offices are very busy, we do not operate like a clinic. We desire to attract and retain a quality-oriented Hygienist who has excellent communication skills. Offices equipped with 5 operatories, digital x-rays, digital charting and PanoRx. Job Requirements: Must have at least 3 years experience; job is for 1 day a week. Serious applicants who desire long-term employment need only apply. Please submit your resume and recent professional photo via email to dentexdental@yahoo.com.

HENRY SCHEIN® PROFESSIONAL PRACTICE TRANSITIONS



& Corporate Broker CA R.E. Lic. #01233804 ic. #0053890 • NV B.O. Lic.

Dr. Thomas Wagner

Transitions Consultan CA R.E. Lic. #01418359

Jim Engel Transitions Consulta CA R.E. Lic. #01898522

"DENTAL PRACTICE BROKERAGE"



Thinh Tran Transitions Consultan CA R.E. Lic. #01863784 Mario Molina Transitions Consultan CA R.E. Lic. #01423762

Making your transition a reality. More information is available on our website regarding practices listed in other states, articles,

VISIT OUR WEBSITE AT: WWW.PPTSALES.COM

Practice Sales • Mergers Partnerships • Appraisals Patient Record Sales

BISHOP: For Sale-General Dentistry Practice & Building. After 29 years in the same location this retiring dentist is selling both his practice and building. Collections were \$1,000,243 in 2011 with \$387,000 adjusted net income. There are 6 days of hygiene in this 5 op., 1,800 sq. ft. building. 100% financing available for both building and practice. Owner has reduced price below valuation price. #14390

upcoming seminars and more.

- CHICO: For Sale-General Dentistry Practice. Owner retiring: 2012 Collections of \$1,385,222 with 7-8 days of hygiene. This excellent, well-established practice in free-standing building has 1,800+ active patients with an average of 15 new patients per month. Equipment includes new Digital Cone Beam X-ray, Digital X-rays, Lasers, and Dentrix software. Buyer can purchase or lease building. Don't miss out on this excellent practice. Owner will consider an associate leading to purchase of practice. #14392
- FRESNO: For Sale-General Dentistry Practice: \$935K in collections in 2011, w/adjusted net income of \$337K. Office is 2,300 sq. ft. and is located in north Fresno in a highly visible professional office complex on a main thoroughfare. There are 6 equipped operatories, owner reports average age of equipment is 4 years. Practice has been operating in present location for over 20 years. Eaglesoft software, owner is retiring. #CA502
- GRASS VALLEY: For Sale-General Dentistry Practice. Gross Receipts of \$491K with an adjusted net income of \$130K. Overhead 73%. Office leased 1,555 sq. ft., 4 equipped operatories, 5 available. Laser, Intra-oral Camera, Cerac, & Eaglesoft Software. Owner would like to retire. #14379
- GRASS VALLEY: For Sale-General Dentistry Practice. Owner retiring, 2012 GR of \$442,736 on 3 day week. 6 Ops, 3 days hygiene, Dentrix software, Pano, Laser, Intra-oral Camera, long time cash practice. Intra-oral Camera, long time cash practice. Approximately 1,950 SF office condominium available to purchase. #14372
- GREATER SACRAMENTO: For Sale Associate to Owner Opportunit: 2012 Gross Receipts of \$879,000. Wellappointed 1,400 sq. ft. office with 5 ops, Intra-oral Cameras, Laser, Cerec, 4 days hygiene, Softdent software. Associate to work two days a week in 2013 & 2014 then purchase practice. Equipment is about 5 years old. Owner to work back 2 days per week for 2 years after purchase. #CA525

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

- LANCASTER: For Sale-General Dentistry Practice. This 4 operatory office is located in 2,360 sq. ft. on the second floor of an attractive Medical-Dental office building. Gross receipts were \$676,000 with a\$174K adjusted net income. Dentist is retiring after 39 years. 4 days of hygiene. Additional operatories could be added to existing space. Great location. Asking price has been significantly lowered! #14376
- LAS VEGAS: For Sale-General Dentistry Practice. This 4 operatory practice is in a great location in a high-end professional building with a view of the city of Las Vegas. It is equipped with an Intra-oral camera, Pano, Laser, and Dentrix software. There are 2 days of hygiene. The staff is well trained to efficiently run this low overhead office with great potential for further growth, 2011 gross receipts were \$727K with adj. net income of \$331K. Doctor moving out of state. PRICE REDUCED! Available for immediate sale. #NV500
- MERCED: For Sale-General Dentistry Practice. This is a tastefully done, 4 op., 1,550 sq. ft. office with 4 and 1/2 days of hygiene/week. All equipment is less than 10 years old and includes 2 Lasers, Intra-oral Camera, Panographic X-ray, Digital X-rays, and Dentrix Software. Molar endo and involved oral surgery cases referred out. Basic general (non-amalgam) type dentistry. 2011 gross was \$878,000 with 4 weeks out as a result of a medical issue. 2010 collections were \$956,000. Excellent location. Seller retiring. PRICE REDUCED!Available for immediate sale. #CA512
- MILLBRAE: For Sale-General Dentistry Practice. This beautiful, well-established office is located on the main thoroughfare of the North Penninsula, offering great exposure that generates 25-30 new patients per month. 5 treatment rooms (6th plumbed) in approx. 1,500 sq. ft. equipped with Digital Pan, Digital Imaging and Intra-Camera. 2011 gross receipts of \$651,000 with . Oral \$230,000 adjusted net income. Owner is retiring. Don't delay, this won't last long! #14395
- NORTH BAY AREA: For Sale-ENDODONTIC Practice: This beautiful Wine Country office has 4 treatment rooms in well-appointed 1,600 sq. ft., digital

imaging, Intra-Oral Camera, and Datacon/Schick software. Office has been in same location for over 20 years with a very strong referral base. Great, long-term staff will ensure a smooth transition. Owner is retiring but is willing to stay during transition. #CA517

- **RIDGECREST:** For Sale General Dentistry Practice and Dental Building: This 4 operatory office is located in 1,536 SF office building. Owner has worked in same location for 32 years and is now retiring. This small practice grossed about \$175K in 2012. Pictures of the building are available upon request. Lots of Potential. #CA523
- SACRAMENTO: For Sale-General Dentistry Practice. Owner moving out of state. 2011 GR \$130,373. 830 SF office with 2 equipped ops. Practice has been in same location since 1981. This is an opportunity for anyone looking to start a practice or open a satellite office with a small investment. #CA522

SACRAMENTO: For Sale-General Dentistry Practice. Gross Receipts\$546K with adjusted net income of \$159K. Office is 2,400 sq ft with 7 operatories. Practice has been operating in the same location for the past 50 years. Pano, Softdent software. Owner to retire. #14374

SAN RAMON: For Sale-FACILITY SALE. Great San Ramon location in professional complex: equipment, leaseholds & furnishings only. 1,400 sq. ft. with 4 equip. treatment rooms (2 additional plumbed), Pano X-ray, Computer Server & Workstations w/Dentrix, Intra-oral Camera & wired for digital. Priced to sell in an upscale community that's home to Chevron, AT&T, Robert Half International, Accenture and Safeway Stores. #CA511

- SAN JOSE: For Sale-FACILITY ONLY: Beautiful Blossom Valley Professional location near Oakridge Mill and Whole Foods Market. Three fully equipped ops in approx. 1,200 sq. ft. including Digital sensor, Eaglesoft software, and full computer network. Avoid the expense of leasehold improvements and equipment with this ready-to-move-in office. Owner relocating just in time to start your own dreams. #CA515
- TURLOCK: For Sale-General Dentistry Practice: Doctor's gross receipts in 2012 were over \$950,000 with only 54% overhead or\$443,777 adjusted net income. There are 8 days of hygiene. Intra-oral camera, Panoramic X-ray, Digital X-rays, and Dentrix software. Owner is retiring. #CA506

CALIFORNIA / NEVADA REGIONAL OFFICE

HENRY SCHEIN PPT INC. California Regional Coporate Office **DR. DENNIS HOOVER. Broker** Office:(800) 519-3458 Office (209) 545-2491 Fax (209) 545-0824 Email: dennis.hoover@henryschein.com 5831 Stoddard Road, Ste. 804 Modesto, CA 95356

Henry Schein PPT Inc., Real Estate Agents and Transitions Consultants

Dr. Tom Wagner (916) 812-3255 N. Calif. Jim Engel (925) 330-2207 S.F./Bay Area

Mario Molina (323) 974-4592 S. Calif. Thinh Tran (949) 533-8308 S. Calif.

CLASSIFIEDS, CONTINUED FROM 448

DENTIST — Great opportunity to be part of great growing, very high-tech office. Start as an associate, potential to be partner if it works out. Very busy IV sedation office but you don't need to certified as IV sedation dentist. Please fax your resume 559.325.0709.

DENTIST — Our office has an opening for a General Dentist to join our team. We are looking for someone who is interested in long-term, stable employment. An opportunity to establish a strong, quality patient base with continued advancement and growth is at hand. We are a private family dental office. We see mostly adults and some kids. We accept most PPO insurances, Liberty (county insurance), and cash patients. We do not accept capitation plans or Medi-Cal. Our office is high tech, comfortable, spacious, and a great environment to work in. Our staff is competent, honest and very friendly. Along with all aspects of general dentistry, applicant must be proficient and comfortable doing routine endo including molars. Difficult cases are fine to refer out. Compensation includes a base pay with percentage threshold bonus pay. Some experience is preferred, but completion of and AEGD or GPR is acceptable. Please send resume and optional picture to put a face to the application for consideration. Thank you for your interest in joining



our team. We look forward to hearing from you. Email resumes to admin@ customdental.com

DENTIST — We are looking for a motivated General Dentist who will join our team as full-time associate. This is a mercury-free, holistic dental practice. Therefore, we are looking for a General Dentist who has the desire and willingness to adapt to our office. We are looking for someone who is interested in a long-term commitment. To schedule interview please contact office manager Tamara Magradze-Whitney at 408.688.1354 or email at tamosia14@yahoo.com.

DENTIST — Need a Dentist who can work on Saturday and Friday if needed. You should know restorative and hygiene. Email resume to preciousdental@yahoo.com.

DENTIST — Looking for full-time or part-time Associate Dentist. H-1 visa can be sponsor. Call 209.606.3594 or send email to dr_hitsmodi@yahoo.com

DENTIST — General dentistry located in Korea town is looking for an Associate Dentist with minimum 3 years experience. Please email resume to sdental101@yahoo. com to schedule an interview.

ORAL SURGEON — New, fast-growing general practice is in need of an Oral Surgeon to take care of all extractions. Very flexible days and hours, we will work with your schedule and what best works for you. All or most materials needed will be provided by office as well as an assistant, if needed. Please fax your resume to 760.775.3938, and include days and time you are available to work.



"MATCHING THE RIGHT DENTIST TO THE RIGHT PRACTICE"

Complete Evaluation of Dental Practices & All Aspects of Buying and Selling Transactions



Serving you: Mike Carroll & Pamela Carroll-Gardiner

3092 SF FACILITY

1,600 sq. ft. street-level dental facility in Marina/Cow Hollow neighborhood across from Presidio with excellent visibility and signage for foot traffic plus easy diagonal parking in front of building. Move in ready with 4 ops., 2 labs, kitchenette, reception and 2 desk areas plus 2 pvt. offices, 2 bathrooms, 1/2 basement & backyard with deck.

4003 SAN JOSE ORTHO

Owner passed away. Practice available immediately contact us for more information. Asking \$295K.

3096 NORTH BAY PERIO

Step into quality practice with established referral base. 2,200 sq. ft. office w/6 fully-equipped ops. Modern facility kept updated with recently purchased chairs, lights, Pano & lasers. Seller will grant a fair market lease and would consider selling the office space. 5 year avg. GR \$1.2M+

3099 LOS GATOS GP

Well-est. general, restorative & cosmetic practice available in very desirable neighborhood **SOL** ous 1,530 sq. ft. office in single story dental complex w/4 ops. Parking is plentiful & easy freeway access. Asking \$580K.

3098 SALINAS GP

Well-known GP specializing in restorative dentistry retiring from 28 year practice located in highly visible downtown office. 4 fully-equipped ops., Panorex, digital x-ray & recent equipment upgrades. 2 year avg. GR \$331K+ w/approx. 152 doctor days/yr.

3995 SAN CARLOS

Seller well-known for quality patient care retiring **Solu** tablished practice with loyal patient base, in highly desireable neighborhood. Asking \$515K.

3085 MODESTO GP

State-of-the-art practice in approx. 2,800 sq. ft. facility w/7 fully-equipped ops. This practice is the stablished dentist or 2 dentists w/experience & who will appreciate a high quality practice. Asking \$745K.

4002 SANTA CRUZ AREA GP & BLDG

Well-est. practice in modern 1,250 sq. ft. office w/4 ops. 5 year avg. GR 630K+ w/ just 4 doctor days. Selling building & practice together. Practice asking price 430K, building to be determined.

4000 SONOMA COUNTY GP

Practice in a relaxing small town community located in the Sonoma wine country. Owner retiring from well-established practice in charming, fully-equipped, 3 op. turn-key facility. Approx. 400 active pts. Asking \$110K.

3094 NORTH BAY PERIO

North Bay Perio now available. Seller retiring from well-est. practice with seasoned staff and active referral base. 1,300 sq. ft. very nice office with 4 fully- equipped operatories. 2012 GR \$450K+ with just 3 1/2 doctor days and 5 days of hygiene per week. Great upside potential since owner does few implants. Asking \$271K.

UPCOMING:

Northern Sonoma County GP Approx. 1,059 sq. ft. facility w/3 fullyequipped ops and dedicated parking in downtown area. Practice & building for sale. Great opportunity.









Contact Us: Carroll & Company 2055 Woodside Road, Ste 160 Redwood City, CA 94061

Phone: 650.403.1010

Email: dental@carrollandco.info

Website: www.carrollandco.info *CA DRE #00777682* CLASSIFIEDS, CONTINUED FROM 450

OFFICES FOR RENT OR LEASE

OFFICE FOR RENT OR LEASE — Shared space/sublease available for General Dentist at upscale, all-digital, 5-operatory Prosthodontic office in Westlake Village. Large, in-office laboratory with modern technology and equipment. Looking for personable, motivated General Dentist with good communication and technical skills. Please email resumes and/or questions to dr.montella@smilesbyaps. com, see photos of office at www. smilesbyaps.com or call 805.494.3377.

OFFICE FOR RENT OR LEASE — 2950 Eureka Way, Suite C. Great, visible location in West Redding. 5-operatory office with room for two more. Staff lounge, sterilization/set-up area, kitchen, supply storage, laboratory and more. Negotiable lease rate and terms. Contact Soren H. Jacobsen, DDS, at 530.510.1186 or email sorendds@gmail.com.

OFFICE FOR RENT OR LEASE — City of Torrance, 750 to 7,000 sq. ft. space available. Central Torrance location with great visibility, signage and parking. Only one block from Little Company of Mary Hospital. Densely populated with PPO insurance patients. In a class "A" building, lease rates and terms are negotiable. Landlord will help generously with tenant improvement to build a brand new suite to fit your needs upon approval of layout, free rent concession with long-term lease. Must see. Please call Rosie at 310.710.2890.

OFFICE FOR RENT OR LEASE — City of Montebello, 1,104 sq. ft., medical/dental suite located at the corner of 6th/Beverly Blvd., close to the 10 and 60 freeways, has a suite available for rent in a newly remodeled building. Great visibility and signage with plenty of patient parking. Great location, within walking distance from Beverly Hospital. Densely populated Hispanic community and many PPO/indemnity insurances in the area. Landlord will help generously with tenant improvements to build a brand-new suite to fit your needs upon layout approval. Rental rate is \$1.95/ sq. ft. with modified gross. Free rent concession with a long-term lease. This is a must-see space/location. Call Rosie at 310.710.2890.

CONTINUES ON 454





Find your next employee!

- Post job openings, search resumes, or both.
- Postings syndicated to Twitter, Facebook, Indeed.com, and more...
- Dental professionals apply online or using our <u>new</u> Mobile App.
- Resume database with pictures and personality test.

Register your dental practice or yourself today - www.DentalPost.net

Questions? Email us at contactus@dentalpost.net



Tonya Lanthier, RDH



Professional Practice Sales

Specialists in the Sale and Appraisal of Dental Practices Serving California Dentists since 1966 How much is your practice worth?? Selling or Buying, Call PPS today! Practices Wanted

NORTHERN CALIFORNIA (415) 899-8580 – (800) 422-2818 Raymond and Edna Irving Ray@PPSsellsDDS.com www.PPSsellsDDS.com California DRE License 1422122

- 6008 MENDOCINO COAST FORT BRAGG Cultural haven offers attractive lifestyle. 2012 collected \$750,000. 4-days of Hygiene. Digital radiography. Computers in ops.
- 6029 NORTHEAST CALIFORNIA ALTURAS Trade in smog and congestion for soaring mountains and close-knit communities. 2012 collected \$514,000 on 3-day week. 3+ days of Hygiene. Strong Recall. Great staff. Beautiful office. 3-ops with Adec delivery systems. Be busy, be happy and take vacations. No worries here.
- **6034 SAN LEANDRO AREA** Did \$650,000 in 2011. Owner reduced time in 2012. Collected \$450,000. 5-ops. Nice Hygiene schedule. Great blue collar practice.
- **6035 SAN FRANCISCO'S EAST BAY ORTHO** Part-time practice collected \$425,000 in 2012. Very desirable location.
- **6038 FREMONT** On part-time schedule due to other responsibilities, collects \$300,000 per year. 2-days of Hygiene.
- 6039 LAKE TAHOE CALIFORNIA SIDE Long established. 2012 collected \$515,000 with 2-months off. Realized Profits of \$230,000+. Attractive 3-op office.
- **6040 SANTA ROSA** Sleeping Giant. Beautiful 4-Op office is paperless, digital and employs laser technology. Collected \$480,000 in 2012. Should have done more! Prior year did \$625,000. Package includes 1,500 sq.ft. condo which shall create a facility cost which shall be cheaper than rent.
- **6041 PLEASANT HILL** Collected \$365,000 with Profits of \$142,000 in 2012. Owner slowing down. Previous 3-years averaged collections of \$415,000 and Profits of \$180,000.
- **6042 BERKELEY** 2012 produced \$1.3 Million and collected \$1.23 Million. Available Profits totaled \$465,000. Owner works just 3-days a week. 6-days of Hygiene per week. Very strong foundation.
- 6043 EL SOBRANTE 3-day practice collected \$170,00 in 2012. 3-ops.
- **6044 MODESTO** Great location in area with new development occurring nearby. Collected \$380,000 last year. Very attractive office.
- **6046 PINOLE** Collected \$500,000 in 2012. 4-days of Hygiene produced \$178,600. Beautiful office. Refers Endo. Lots of Goodwill here.
- **6045 TRACY, STOCKTON, MANTECA, MODESTO AREA** Beautiful office with great location. 3 Ops with two more wired/plumbed. Investment 10-years was \$180,000. Practice has done more when Owner worked harder. 2012 collected \$327,000 on a 3-day work week with 5-weeks off.

FOUNDERS OF PRACTICE SALES

115+ years of combined expertise and experience! 3,000+ Sales - 10,000+ Appraisals **CONFIDENTIAL**

PPS Representatives do not give our business name when returning your calls.

SOUTHERN CALIFORNIA (714) 832-0230 – (800) 695-2732 Thomas Fitterer and Dean George PPSincnet@aol.com www.PPSDental.com California DRE License 324962

- 3350 ANAHEIM HILLS Partner with Lady DDS who will sell all in 3 years. Purchase half now for 50% of Gross. Beautiful Hi Tech office.
- 3351 CARLSBAD 4,000 sq.ft. Freeway Visibility. Grossed Million+, Absentee Seller. 12 Ops. Develop Solo Group. Specialists will pay for your investment. FP RE \$1.5 Million and Practice \$685,000.
- 3352 BAKER/VISTA LAKE SAN MARCOS Established 20+ years. Recently moved to prestigious Hi-Traffic location. 4 Ops with 10 plumbed. State of Art. Collections \$50K/month. FP \$550,000.
- 3353 EAST SAN DIEGO DDS in a pickle will assist Buyer to Gross average \$50K/month. FP \$300,000. Unusual opportunity. Seller would sell half @ \$165,000.
- 3354 GRANADA HILLS BEST PRACTICE NO PPO's NO HMO NO MEDICAL Cash and Insurance. Established 45 years. Hi identity building. Property could be purchased. Grossing \$1.1 Million. 7 Ops. FP \$.1.2 Million for Practice. .
- 3355 SAN FERNANDO PRACTICE & VALUABLE RE Hispanic Market. 60-to-70 NPs/month. Store front. \$40,000 Digital sign changeable with Dental Ads to 1,000's of passing cars daily in Front of High Traffic intersection. 7 Ops. Practice and RE \$3.3 million.
- 3356 APPLE VALLEY VICTORVILLE Grossed \$675,000. Modern Hi Identity shopping center. 8 Ops. With little marketing, will do \$800K next year. Great Profits.
- **3357 CUCAMONGA** Shopping center on 210 Freeway. 50-to-70 new patients/month. 2013 is projecting \$1.2 Million. Beautiful 5 Ops.
- **3358 TEMECULA** Seller busy with young family and two thriving practices. Can take in Partner for one with option to buy all once Buyer bonds with patients. Buyer should Gross minimum of \$500K.
- 3359 ONTARIO Stater Brothers Center. Hispanic patients. 5 Ops plumbed, 3 equipped. Rent less than \$3,500/month. Needs marketing to do \$500K+/year.
- 3360 PALMDALE BARGAIN Shopping center. 4 Ops, grossing \$15K-to-\$25K part time by Absentee DDS. Full time DDS will do up to \$600K like prior Owner. Asking \$185,000.
- 3361 FONTANA SUPER HI IDENTITY Shopping center. 4 Ops. All Hispanic, next to McDonald's. Part time DDS. FP \$285,000.
- **3362 BALDWIN PARK** Established 20+ years. 3 Ops in 1,000 sq.ft., Lady DDS Retiring. Conservative Seller needs to sell. Eager Buyer will gross in excess of \$500K in this hi Identity Dental Building.
- 3363 LAMONT/ARVIN GP/ORTHO Grossing \$30K/month on 2 days. Beautiful 4 Op office. RE For Sale as well. 3,000 sq.ft. includes apt. Full time DDS will do \$40K+/month.
- 3364 RIALTO Dental/Medical Building 18,000 sq.ft.. Room to build self-storage center in back. \$1,200,000 or make Offer.
- 3365 YUCCA VALLEY Hi Identity. Small practice needs TLC. On major Highway. Full Price \$165,000.
- **3366 INDIO** First Dental Building in Indio. New campus for 3,000 students being built 2 blocks away. Hi Identity.

SELL YOUR ORANGE COUNTY OR LA PRACTICE GROSSING \$500K AND ASK PPS FOR A PRACTICE NETTING \$500K OR MORE.

BUYERS AND SELLERS SAY – "We have dealt with other firms - we like YOUR professional expertise. We will recommend <u>YOU</u> to all our colleagues. Thank you."





Paul Maimone Broker/Owner

Thank You for Visiting Us at the Anaheim CDA

ANTELOPE VALLEY - (7) op comput. G.P. in a free standing bldg. Newer eqt., digital X-rays. Annual Gross Collect \$1.5M. Cash/Ins/PPO pts. 20-30 new pts/mos. (50) yrs. of Goodwill.

BAKERSFIELD #21 - (10) op comput. G.P. & Bldg. on main St. (3) ops fully eqt'd. (3) ops part eqt'd & (4) plumbed. Store front w exposure. Collects ~\$500K/yr. Cash/Ins/PPO. PENDING

BAKERSFIELD #25 - 4 op comput. G.P. & free stand. duplex bldg. for sale. Located on a main thoroughfare. Cash/Ins/PPO pts. (3) days/wk of hygiene. Gross Collections \$400K/yr.

BAKERSFIELD #26 -3,500 sq ft free stand. duplex bldg. w a (5) op fully equipped turnkey dental office. Located on a main thoroughfare w monument signage. Move in condition. NEW

BALDWIN HILLS - Leaseholds w some eqt'd & approx. 325 active pts. (3) op starter G.P. located in a prof. bldg. Very low overhead & very affordable sale price. Mixed pts. NEW

CAMARILLO #3 - (3) op comput. G.P. located in a large strip ctr. w signage. On a main thoroughfare. (2) ops eqt'd third plumbed. Cash/Ins/PPO. 2012 Gross Collect \$131K p.t. NEW

<u>CENTRAL VALLEY/So. FRESNO COUNTY</u> – (3) op comput. G.P. in smaller town \underline{w} ltd. competition. Newer eqt. Networked & digital. Dentrix & Dexis. Gross Collect \$40K+/mos.

CORONA – Dental Spa & Free Stand. Bldg. for sale. (5) op comput. G.P. w (2) spa rooms; one for facials & one for massage. Drop dead gorgeous facility w all the special touches. New eqt'd. Digital X-rays. Pano eqt'd. Production of \$1.2M on a (4) day week. NEW

SAN JOAQUIN VALLEY - G.P. & Bldg. in small town w ltd. competition. (4) op comput. office. Cash/Ins/PPO. Annual Gross Collect \$500K+. Low overhead. Seller retiring. REDUCED

So. PASADENA - EMERGENCY SALE! SELLER PASSED AWAY! - (5) op comput. G.P. in a small dental/medical bldg. on a main thoroughfare. Fee for Service cash & Delta Premier pts. 2012 Gross Collect \$1.2M+. (8) days of hygiene/wk. Digital X-rays & central nitrous. SOLD

SOUTHGATE - (6) op comput. turnkey G.P. No pts. Newly remodeled. (4) ops of new eqt. Located on a major thoroughfare w lots of walkins. Exposure/visibility & signage. NEW

TOLUCA LAKE - Starter Pract. (4) op comput. G.P. (2) ops eqt'd w new eqt./(2) plumbed. Digital X-rays. In free stand. bldg. Main thoroughfare. Collect ~ \$10k/mos on (1) day/wk NEW

VISALIA - (4) op comput. G.P. and triplex bldg. for sale. Gross ~ \$20K/mos. p.t. NEW

WEST SAN FERNANDO VALLEY PEDO/ORTHO OFFICE - Comput. Pedo/Ortho office. (3) op open bay & (1) op quiet room. Pano eqt'd. Digital X-rays. Cash/Ins/PPO small % Denti-Cal. 30+ years of Goodwill. Annual Gross Collect \$600K+. Seller retiring but will assist with transition and/or stay to do Ortho. NEW

UPCOMING PRACTICES: Agoura, Alhambra, Beverly Hills, Camarillo, Covina, Corona, Glendora, Montebello, Monrovia, Pasadena, SFV, Torrance, West Covina, & Woodland Hills.

D & M SERVICES:

• Practice Sales & Appraisals

- Practice & Equipment Financing
- Expert Witness Court Testimony
- Practice Search & Matching Services • Locate & Negotiate Dental Lease Space
- Pre Death and Disability Planning

 Medical/Dental Bldg. Sales & Leasing • Pre - Sale Planning

P.O. Box #6681, WOODLAND HILLS, CA. 91365 Toll Free 866.425.1877 Outside So. CA or 818.591.1401 Fax: 818.591.1998 www.dmpractice.com CA DRE Broker License # 01172430

CA Representative for the National Associaton of Practice Brokers (NAPB)

CLASSIFIEDS, CONTINUED FROM 452

OFFICE FOR RENT OR LEASE — Great opportunity in Irvine, Calif., to sublease 2 operatories in our 5-operatory office. The office suite is in a 3-story medical building. The operatories are plumbed and ready for you to add your chairs and X-ray units. There is plenty of room for your supplies and a huge front-desk area with room for your computer and office supplies. Great for someone looking to cut overhead. Email us at russellcannondds@earthlink.net. check out our office on our website at drrussellcannon.com or call us at 949.552.7874.

PRACTICE FOR SALE — Time to retire. General practice, 1,426 sq. ft. condo office in Fresno. 4 equipped operatories. Pano, intraoral camera, nitrous. Located in a nice professional complex. 3 days per week hygiene. Motivated seller, \$125K, option to lease or purchase building. Call 559.434.6294.

PRACTICE FOR SALE — Practice located in rural community in beautiful recreational area of northeast California. 5-year-old equipment, newly remodeled office, 4 ops, Pano, Nobel Biocare Implant System and much more. 3 days per week hygiene. Collected \$746K in 2010 on 5 days per week, \$527K in 2011 on 3 days per week and \$538K in 2012 on 3 days per week. Great Christian staff, reasonable rent. Asking \$175K. Email ddspractice4sale@yahoo.com for more information.

QUESTIONS MOST OFTEN ASKED BY SELLERS:

- **1.** Can I get all cash for the sale of my practice?
- **2.** If I decide to assist the Buyer with financing, how can I be guaranteed payment of the balance of the sales price?
- **3.** Can I sell my practice and continue to work on a part time basis?
- **4.** How can I most successfully transfer my patients to the new dentist?
- **5.** What if I have some reservation about a prospective Buyer of my practice?
- **6.** How can I be certain my Broker will demonstrate absolute discretion in handling the transaction in all aspects, including dealing with personnel and patients?
- **7.** What are the tax and legal ramifications when a dental practice is sold?

QUESTIONS MOST OFTEN ASKED BY BUYERS:

- **1.** Can I afford to buy a dental practice?
- **2.** Can I afford not to buy a dental practice?
- **3.** What are ALL of the benefits of owning a practice?
- **4.** What kinds of assets will help me qualify for financing the purchase of a practice?
- **5.** Is it possible to purchase a practice without a personal cash investment?
- **6.** What kinds of things should a Buyer consider when evaluating a practice?
- **7.** What are the tax consequences for the Buyer when purchasing a practice?

Lee Skarin & Associates have been successfully assisting Sellers and Buyers of Dental Practices for nearly 30 years in providing the answers to these and other questions that have been of concern to Dentists.

Call at anytime for a no obligation response to any or all of your questions Visit our website for current listings: www.LeeSkarinandAssociates.com



CA DRE #00863149

ADVERTISER INDEX

California Practice Sales	calpraticesales.net	444
CariFree	carifree.com	406
Carroll & Company Practice Sales	carrollandco.info	451
CDA Membership	cda.org/member	405
CDA Practice Support Center	cdacompass.com	384-385
D&M Practice Sales	dmpractice.com	454
Dental Choice	successfuldentists.ca	404
Dental Post	dentalpost.net	452
Implant Direct	implantdirect.com	380
Keller Laboratories	kellerlab.com	459
Lee Skarin & Associates	leeskarinandassociates.com	455
Paragon Dental Practice Transitions	paragon.us.com	450
Practice Transition Partners	practicetransitions.com	448
Professional Practice Sales of the Great West	415-899-8580	453
Professional Practice Transitions	pptsales.com	449
Stratus Dental Group	stratusdental.com/cda	398-399
TDIC	tdicsolutions.com	374
TOLD Partners	told.com	445
Ultradent	ultradent.com	460
Western Practice Sales/John M. Cahill Associates	westernpracticesales.com	416, 420, 447

FOR ADVERTISING INFORMATION, PLEASE CONTACT COREY GERHARD AT 916-554-5304.

CONTINUED FROM 458

can be only measured by the small print in next month's phone bill. This is an x-chromosome thing and has nothing to do with sexism. The point is, all parties described belong to a pre-texting, pre-Twitter generation that believes the phenomenon of "texting" is the dumbest thing since smoke signals and semaphore were considered avant-garde.

That generation has seen the demise of cursive writing, complete sentences and the general acceptance of language formerly only in the province of longshoremen. Current "music" from sold-out venues projects decibels clearly heard on the orbiting Space Station. My generation fortunately stopped understanding the lyrics shortly after the death of Nat "King" Cole.

My granddaughter pauses briefly, thumbs stilled as I ask, "You talking to somebody?"

"Yeah," she says, not looking up.

"Why don't you just dial or click or whatever on that over-apped thing you call a telephone?" I ask in my primitive grandfather voice.

"Because she's gonna be offline for a minute."

"For a whole minute! How do you know?" She held up the phone, the one with the candy-apple case, no antenna, wires or reason to exist as far as I could see, but whose loss would be the death knell of her social life and leave her bereft of the will to live.

"See?" she said patiently, as if to a small child, fingering a luminous screen just large enough to accommodate three words of 14-point Times New Roman font. "She just texted me."

"Ah," I said, defeated, because suddenly it was 1935. I was 15, seated at a littered desk in my bedroom, earphones clamped to my ears. I was "talking" to somebody I had just met in New Zealand. For 12 years, my mother was justified in refusing to venture beyond my bedroom door for fear of being electrocuted.

He said, "Handle Graham."

I said, "Bob hr."

Graham said, "Tnx 4 QSO bob read u RST 559."

I said, "FB om ur QRA?"

"Christchurch wx hr gud but sum QRN u QSL?"

"K gotta QRT hi to ur XYL 73 cul W6MNV ar."

This brief exchange would be completely understandable by a certain group, but Greek to wives or parents — the whole point. Actually, my new BFF Graham and I didn't "say" a word. We were texting and didn't even know it. Tweeting and texting new? Hardly. I was doing that nearly 80 years ago.

That was amateur radio, we were "hams." Graham might have been 50 years old, no matter. Ham radio knew no generational barriers. My hero was Samuel F.B. Morse, a Phi Beta Kappa graduate of Yale who died at age 80 in 1872. He left me the gift of the Morse Code by which I was able to tap out CQ, CQ (seek you) de W6MNV that served as a dah-dit invitation to any hams all over the world who happened to be scanning the amateur bands and fancied a QSO (chat).

Without any visible means of support beyond the \$6 a month earned from my paper route, equipping an amateur radio station in my bedroom became a do-it-yourself obsession. For 12 years, my mother was justified in refusing to venture beyond my bedroom door for fear of being electrocuted. Commercial gear was beyond the reach of my peers. Armed with a pair of needle-nosed pliers and a soldering iron plus a semester of electric shop in junior high school, a pre-geek kid could create wonders of "breadboard" transmitters and shortwave receivers long before iPads, motherboards and microchips were dreamed of.

"Im running 1 KW frm 850 Eimacs thru a 20 mtr Zepp" would be a clear response to the query "Ur rig?" I was 35 years old when Bill Gates was born and 20 years before that I was talking to Graham in Christchurch, or Mephista, in Bombay. I was an enthusiastic midwife at the birth of Mickey Mouse in 1928 and reluctantly sacrificed my 25cent weekly allowance during the Great Depression. That was then.

Now my granddaughters routinely "talk" via texting to people within yelling distance, using devices so complicated it takes two thumbs to operate them. My newly born great-grandson may be using some sort of mental telepathy before he's out of nursery school. If he's performing this with some other 4-year-old kid, the whole interchange won't last more than 45 seconds. Unless it's a girl. Is this a great world or what?

We're taking your requests

If you have a favorite Dr. Bob column you want to see again, email Publications Specialist Andrea LaMattina at Andrea.LaMattina@cda.org. We will oblige by reprinting those requested favorites interspersed with any new Dr. Bob submissions.

Dr. Bob

Is Anybody Out There?



Tweeting and texting new? Hardly. I was doing that nearly 80 years ago.

Robert E.
Horseman,
DDS

ILLUSTRATION BY VAL B. MINA Show me a picture of somebody talking on a telephone. Statistically, the phone will be held to the left ear, steadied there by the left hand, unless the person is a lefty, then it's the other way around, even if both ears are fully functional. This frees the dominant hand to write down important things, which almost never happens because there is never a pencil handy.

Show me a picture of the person on the other end of the line. Both parties can be either men or women or mixed, but one thing is certain — they will both be old people and sitting down. I know this, because where I come from (the 20th century), that is what you do when the person you want to talk with is not in the same room or the same hemisphere. You don't wander around from room to room, drive a car, skydive or shop for shoes. You sit, maybe cross your legs.

Should both talkers be men, the time spent before breaking the connection will be no more than 45 seconds, one minute, tops.

Jim: George?

George: Yeah?

Jim: Golf tomorrow? Tee-off 6:30. *George:* Right! See ya.

Click

Mrs. George: Who was that?

George: Wrong number.

If both communicators are women, time as a concept doesn't exist, but

FINALLY, A BITE GUARD THAT TAKES REQUESTS.

NTI-tss Plus[™] Soft. Clearly versatile.

The multi-talented NTI-tss Plus Soft performs beautifully for even the toughest audiences—extreme crowding, veneers, slightly mobile or sensitive teeth... It extends to the second bicuspids for greater retention. The Discluding Element reduces clenching, bruxing and headaches, and the soft interior provides maximum comfort that's easy to wear and even easier to deliver. NTI-tss Plus Soft. Clearly better.





Be Bright

Opalescence is the smart choice to give your patients the bright, white smiles they've always wanted.

Because smiles are made to be bright.

Call for a Free Sample 800.552.5512 Promo Code 13F04

PROUD USA MANUFACTURER WANUFACTURER Ultradent is a proud USA manufacturer.To learn more visit ultradent.com/USA



800.552.5512 | ultradent.com ©2012 Ultradent Products, Inc. All Rights Reserved.



PRODUCTS, INC.