OF THE CALIFORNIA DENTAL ASSOCIATION

Journal

FEBRUARY 2010

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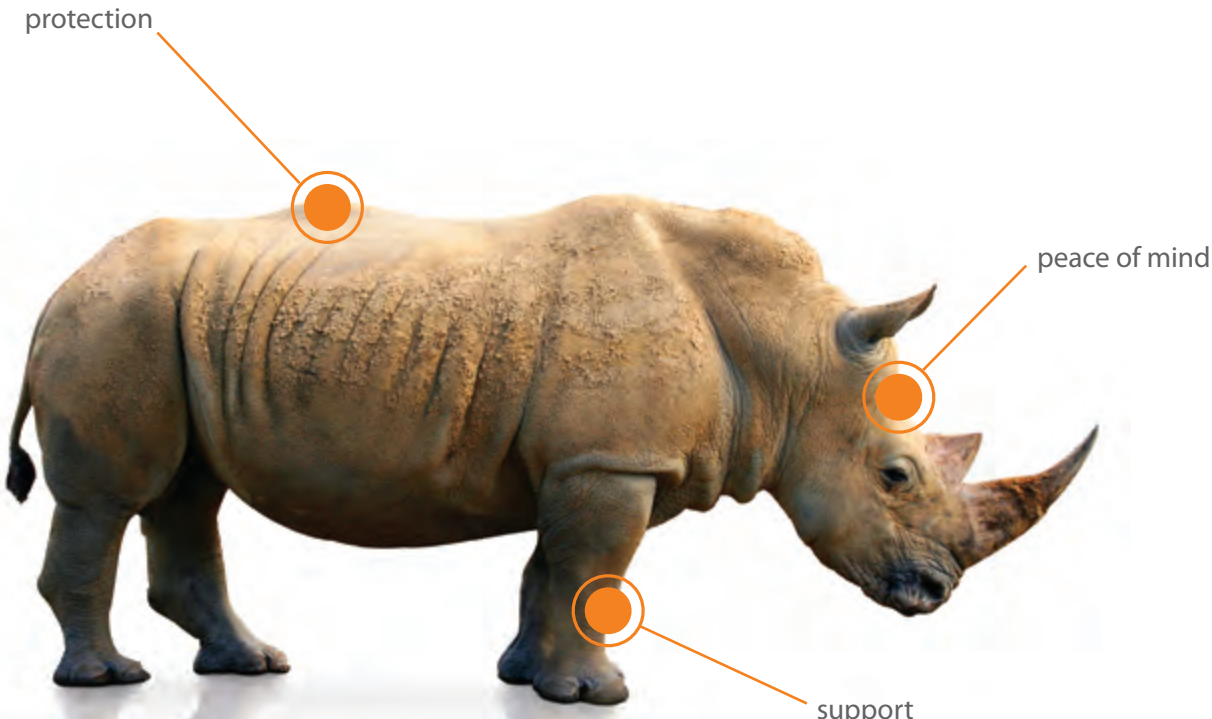

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OF THE CALIFORNIA DENTAL ASSOCIATION

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FEBRUARY 2010

cda

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CDA JOURNAL, VOL 38, Nº2

Struggle

RUCHI K. SAHOTA, DDS, CDE

According to a recent California Dental Association survey, most of us are satisfied with our profession. A recent CNN article cited, "despite the stress of combining motherhood and a job, (working) moms are happier with their lives than are their at-home counterparts."[1]

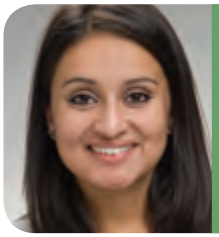
There are more women graduating from dental schools than ever before. Yet, many female dentists have to juggle. They juggle practice, manage office personnel, take care of their kids, deal with household chores, and cart their kids to soccer, dance, gymnastics, and the unexpected trips to the pediatrician.

My mother juggled. She started a practice almost 30 years ago. Within months of buying a new office space and building a practice from scratch with no patients, my mother — a new dentist — became a single mom.

Overnight, she had to deal with managing the practice on her own, something my father had helped her with before. She was now the sole parent, taking care of my 5-year-old brother and me. As any good mom, she was trying to raise us with good values, life experiences, and disciplined principles.

But she faced struggle. She was paying back practice loans and managing a household while making a living for all of us. Amid these time-consuming responsibilities, mom made it to all of our soccer games and all of our parent-teacher conferences. My mother. My hero. My rock star.

But isn't there a little rock star in all dentists? We are Little League coaches. We are Rotary Club presidents. We are loyal family event attendees. We do it all while managing our practices, managing our patient's needs, and managing our employees. It gets tough. It gets busy. And at times, we teeter on the seesaw of work-life balance.



We appreciate the opportunity to serve our patients. We serve our communities.

Earlier this year, I found myself on that seesaw. What brought me there? Five words. My Big Fat Indian Wedding. Think of the scenes from the movie *Monsoon Wedding* — times three. There were so many decisions to make this once-in-a-lifetime day — special.

My mother has a lot of friends, and they were all invited. The decorations were splendid. Think brilliant, bright, and beautiful colors. Our rich Indian tradition of food, food, and more food was justified in the many courses that were served throughout the day. And above all, this born and raised in California girl wanted to uphold every Punjabi tradition possible on that special day. We were not going to go over the top, but it was going to be a lot of work.

My mom and I had just finished wrapping up a grueling four-month renovation of our office. No more contractors. No more disruptions to the practice. Now I could spend all my waking (and sleepless) hours on something more fun: planning the wedding.

Then, two months before the wedding, two officers of our dental society resigned. I had two more years before I was to become president. But suddenly, I had to step in as president. I felt so close to losing all sense of balance. Our 700 members were now depending on me. Where do I start?

I felt like I had no control. I felt like the circus juggler, spinning plates on thin rods, with the fear of any one of the dishes crashing to the ground. Decisions were flooding me. Running the office, running a dental society, and, of course, racing toward my special day, all started to weigh down on me. I needed to do it all and do it well. But I needed some balance too.

Reinhold Niebuhr once said, "God grant me the serenity to accept the things I cannot change, the courage to change the things I can, and the wisdom to know the difference." So we try to delegate tasks. We make timelines. We associate a check mark on our to-do lists with a sense of completion. And we try not to sweat the small stuff.

But in the office, we are all about the patients and the small stuff. Our world revolves around tissues, periodontal probings, and margins, margins, margins. There are the third-party payer issues. There are personnel issues. There are patients that take issue. And then we have day-to-day hiccups in our otherwise predictable day.

One day, there was a leak in our ceiling from a recent rain. Another day there was a glitch in our digital sensor in our root canal room. Then there was the flu. First, the hygienist, then the office manager, then right in the middle of a jam-packed day, it's finally you contracting the awful, two-week, incapacitating flu.

Life can be a struggle. And yet through it all, we enjoy a wonderful life. We appreciate the opportunity to serve our patients. We serve our communities. The

actual dentistry becomes the easy, almost meditative, points of our day. We make a good living, so we can enjoy a comfortable lifestyle. We are leaders in the community. We listen. We support. We give back. Thus, many opportunities come our way.

One of the most successful "busy women" of our lifetime, Oprah Winfrey said, "Before you agree to do anything that might add even the smallest amount of stress to your life, ask yourself: What is my truest intention?"

Life throws many choices our way. Our paths are marked by many opportunities. Sometimes we get to chose what and how we deal with those opportunities. And sometimes we do not. However, I know that my Big Fat Indian Wedding was the happiest day of my life. I know that my mom is proud of her two kids, and her two kids are proud of how she raised them.

I am reminded of an excerpt from Max Ehrmann's famous poem, *Desiderata*, "Enjoy your achievements as well as your plans. Keep interested in your own career, however humble; it is a real possession in the changing fortunes of time." I know that a majority of us dentists are proud to be dentists and happy with their career choices.[2] But every hiccup of every day can hopefully remind us that we are all going through the same thing. We all have struggle. And as we look at struggles of many of our patients in this terrible economy and teeter on our own seesaws, we have to admit, we have it pretty good. ■■■■

REFERENCES

1. Survey: Working moms are busy, but happy." CNN Wire, Oct. 8, 2009.
2. Mind of the Dentist Survey. California Dental Association. Edge Research, 2004.

Address comments, letters, and questions to the editor to kerry.carney@cda.org.

Feedback on 'The Price of Soft Drinks'

Re: The editorial "The Price of Soft Drinks," (Pages 757-758, November 2009):

Your belief that a tax on soda would cut down on consumption and increase revenue for the government is just insane. First off, when has a tax ever been used for what the government says it will be used and not go to the general fund? Just take the gas tax. None of that money goes to its intended purpose.

Why do we need the government controlling more of our lives? I pay too much in taxes to a government that does nothing. And where would you have the government stop? Water can be unhealthy so why not tax ... wait, water is already taxed. Butter can be unhealthy if you eat too much, so let's tax butter. Should we just tax everything someone says to be unhealthy? Why is it the government's job to make sure people do not drink too much soda? Where should we draw the line? Should the government be weighing everyone to make sure no one is overweight? You are wrong on this issue, and I hope the CDA does not agree with you. We need less government, not more. Let people get fat if they choose. Let people drink as much soda as they choose without the government punishing them.

JASHON HUGHES, DDS
Lincoln, Calif.

Reader Supports Soda Tax Proposal

Dr. Brian Shue's editorial in the November *Journal* ("The Price of Soft Drinks," Pages 757-758, November 2009) was like a breath of fresh air.

As dentists, we know the damage caused by sugary soft drinks. As long as people consume these harmful substances, we will not be able to repair their teeth fast enough to keep up with the harm that they do.

Because we see the damage in people's mouths, we can relate this to the patient and make the connection between the cause and the effect. We have to walk our talk and help our patients become healthier by connecting their diet and lifestyle to what we see in their mouth. We can refer them for medical evaluation, if necessary, to intercept early diabetes or other lifestyle-related diseases.

Primary prevention is still the ideal. It is what makes us health professionals as opposed to repairmen.

PHILIP HORDINER, DDS
Mill Valley, Calif.

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Deborah Zemke

CDA Foundation Publishes Guidelines for Dental Care During Pregnancy

The California Dental Association Foundation, in collaboration with the American College of Obstetricians and Gynecologists, District IX (ACOG District IX), recently completed *Oral Health During Pregnancy and Early Childhood: Evidence-based Guidelines for Health Professionals* to substantiate the relationship between health and oral health status, and promote the importance and safety of dental care during pregnancy.

In February 2009, an expert panel of medical and dental professionals presented a review of scientific literature and recent research to derive practice guide-

CONTINUES ON 87

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Flexitime VPS now comes in two new impression matierials: Light Flow and Medium Flow. These materials provide precise detail for an accurate marginal fit. In addition, Flexitime is strong and prevents tears and distortion when removed. Flexitime Light Flow and Medium Flow offers superior performance even in moist environments. For more information visit heraeus-kulzer-us.com.

Mercy Ships, MediSend International, Deliver 'Hope and Healing'

Mercy Ships, in partnership with MediSend International, is again on the go. This time to the West African country of Togo.

"We are proud and privileged to be partnered with such a prominent and respected organization as Mercy Ships. Our philosophies and values are very much aligned," said Nick Hallack, president and CEO of MediSend International.

The humanitarian organizations, both based in Texas, will help develop a sustainable infrastructure in hospitals in developing countries, develop comprehensive training programs, including biomedical repair technologies.

The ship is home to six state-of-the-art operating rooms, an intensive care unit, and bed space for up to 78 patients. Crew members from more than 30 nations serve onboard as volunteers. Togolese biomedical technicians trained by MediSend will help to carry on and further the work begun by the Africa Mercy.

MediSend is currently working in Nigeria, Equatorial Guinea, Ghana, the Democratic Republic of Congo, Chad, Liberia, and Kazakhstan. MediSend's comprehensive biomedical repair training programs will be the cornerstone of the relationship with Mercy Ships.

"We have chosen MediSend for its excellence in the field of education and training in biomedical technologies and the design of biomedical repair laboratories specifically for developing countries," said Don Stephens, founder and president of Mercy Ships. "MediSend's experience and expertise in biomedical technologies will greatly enhance the Mercy Ships mission to deliver hope and healing."

PJ Accetturo/© Mercy Ships 2009

"What could be better than using the body's own regenerative powers to grow bone and soft tissue safely and quickly?

JAMES RUTKOWSKI, DMD, PHD

Bone and Tissue Growth for Implants Enhanced by Platelet-Rich Plasma

Platelet-rich plasma therapy, which quickly is gaining acceptance in sports medicine and orthopedics, also is showing great promise when it comes to dental implant procedures.

At the recent annual scientific meeting of the American Academy of Implant Dentistry, the platelet-rich therapy accelerates bone and tissue growth and wound healing, and can help assure long-term success of dental implant placements, according James Rutkowski, DMD, PhD, a prominent dental researcher and editor of the *Journal of Oral Implantology*.

"What could be better than using the body's own regenerative powers to grow bone and soft tissue safely and quickly? For dental implant procedures, PRP treatments can jump-start bone growth and implant adherence in just two weeks, which cuts down the time between implant placement and affixing the permanent crown," Rutkowski said.

Obtained from a small sample of the patient's own blood, platelet-rich plasma is centrifuged to separate red blood cells from platelet growth factors. The concentration of platelets triggers fast growth of soft tissue and new bone. "There is very little risk because we are accelerating the natural process in which the body heals itself," said Rutkowski. "PRP speeds up the healing process at the cellular level, and there is virtually no risk for allergic reaction or rejection because we use the patient's own blood."

Some orthopedic physicians have been using PRP with success for painful and hard to treat injuries like tennis elbow, tendonitis, and ligament damage, said Rutkowski. In dental surgery applications, Rutkowski said PRP is mixed as a gel that can be applied directly in tooth sockets and other sites. It also is effective in cases when bone grafts are required to foster proper bone integration for implants.

Even Edentulous Patients Can Benefit From Snore-Reducing Devices

A recent case report has demonstrated that it may not be entirely necessary to have at least a half-dozen natural teeth to keep an oral snore-reducing appliance in place.

In an issue of the *Journal of Oral Implantology*, authors described the construction and successful use of such a device in a female patient who was edentulous in her lower jaw. The case focused on mandibular protrusion. Two endosseous implants were surgically placed to retain the denture, as well as the removable snore-reduction appliance. When secured in a protrusive, but comfortable manner, a greater airway space was created, according to a press release, which also reported the woman and her husband said they got more restful sleep following the surgery.

According to the report, the appliance was constructed by vacu-form fitting the patient's upper natural teeth and lower denture to soft/hard dual-laminate appliance parts that then were bonded together with cold-cure clear acrylic.

The study also looked at other conditions that play a factor in the success of snore-reducing appliances: severity of sleep apnea, the patient's body-mass index, and sleep position.

To read the entire article, "A Removable Snore Reduction Appliance for a Mandibular Edentulous Patient," go to allenpress.com/pdf/aaid-35_5joi-d-09fnl.1[1].pdf.

DENTAL CARE, CONTINUED FROM 85

lines based on evidence and professional consensus. Where possible, the material was adapted, supplemented, updated, and rewritten based on the 2006 New York State Department of Health publication, *Oral Health Care During Pregnancy and Early Childhood Practice Guidelines*.

Good oral health and control of oral disease protects a woman's health and quality of life before and during pregnancy, and has the potential to reduce the transmission of pathogenic bacteria from mothers to their children. Yet many women do not seek — and are not advised to seek dental care as part of their prenatal care although pregnancy provides a "teachable moment," as well as the only time some woman are eligible for dental benefits.

Prenatal and oral health providers are limited in providing oral health care during pregnancy by their lack of understanding about its impact and safety. Dentists may needlessly withhold or delay treatment of pregnant patients because they fear injuring either the woman or the fetus or because they fear litigation. Many prenatal providers fail to refer their patients regularly to dental providers because they have not been trained to understand the relationship between oral health and overall health. A coordinated effort between the oral health and prenatal communities can benefit maternal and child oral health outcomes.

The timing of such care is vital given that their oral health has the potential to impact the oral health status of their children. Further, assessment of oral health risks in infants and young children with appropriate intervention, along with anticipatory guidance for parents and other caregivers, has the potential to prevent the transmissibility and development of early childhood caries.

The most common complications of pregnancy include spontaneous abortion (miscarriage), preterm birth, preeclampsia (pregnancy-induced hypertension), and gestational diabetes. The current scientific studies, referenced to in this document, regarding these conditions related to dental care indicate:

- Control of oral diseases in pregnant women has the potential to reduce the transmission of oral bacteria from mothers to their children.
- There is no evidence relating early spontaneous abortion to first trimester oral health care or dental procedures.
- Preeclampsia is a challenging condition in the management of the pregnant patient, but preeclampsia is not a contraindication to dental care.
- While research is ongoing, the best available evidence to date shows no effect of periodontal treatment on birth outcomes of preterm labor and low preterm birth weight, and is safe for the mother and fetus.
- Because it has been shown to be safe and effective in reducing periodontal disease and periodontal pathogens, best practice suggests that periodontal care should be provided during pregnancy.

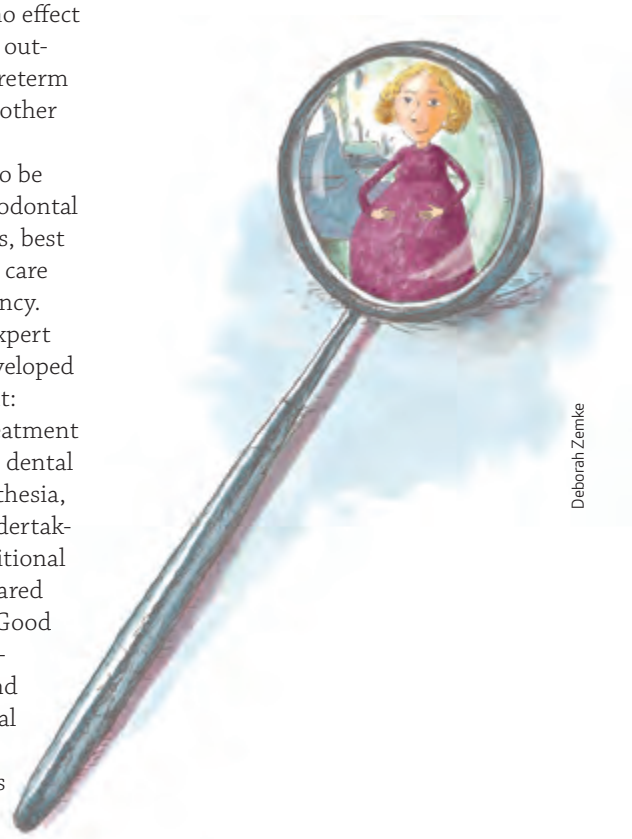
Based on these findings, the expert panel and advisory committee developed the following consensus statement:

"Prevention, diagnosis and treatment of oral diseases, including needed dental radiographs and use of local anesthesia, is highly beneficial and can be undertaken during pregnancy with no additional fetal or maternal risk when compared to the risk of not providing care. Good oral health and control of oral disease protects a woman's health and quality of life and has the potential to reduce the transmission of pathogenic bacteria from mothers to their children."

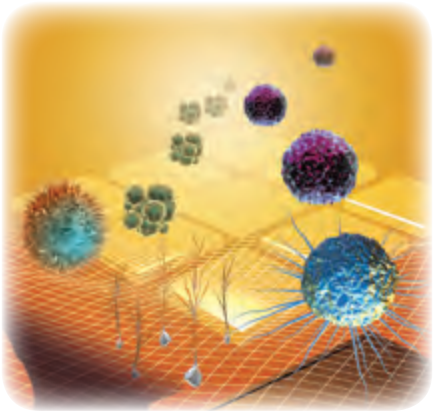
The complete guidelines — for medical, dental, early childhood and public health providers — and evidence-based information can be downloaded from CDA Foundation's Web site at: cdafoundation.org/guidelines.
The guidelines will be printed in their entirety in the June 2010 issue of the *Journal of the California Dental Association*.

To request a hard copy of the guidelines, contact Rolande Tellier Loftus, MBA, program director, at rolande.loftus@cda.org.

Best practice suggests that periodontal care should be provided during pregnancy.



Deborah Zemke



Major Strides Made in Dental Stem Cells Research

Italian scientists at Second University of Naples have been able to reconstruct a human mandible bone with autologous dental pulp stem cells.

This groundbreaking accomplishment marks the first time dental stem cell research has moved from the laboratory to human clinical trials, according a press release. The repair and bone regeneration is significant for the oral maxillofacial field since repair of these bones are extremely intricate and complex.

The authors, whose research was published in the November 2009 issue of *European Cells and Materials Journal*, utilized a biocomplex constructed from dental pulp stem/progenitor cells, DPCs, and a collagen sponge scaffold for oro-maxillofacial bone tissue repair in those patients who required third molar extractions, according to their abstract.

Defects without walls had been formed in patients who presented with bilateral bone reabsorption of the alveolar ridge distal to the second molar secondary to impaction of the third molar on the cortical alveolar lamina. Loss of the adjacent second molar may result from the condition not permitting spontaneous bone repair after removal of the third molar.

Scientists extracted maxillary third molars first for DPC isolation and expansion. Cells then were seeded onto a collagen sponge scaffold and the obtained biocomplex was utilized to fill in the injury site left by extraction of the mandibular third molars, according to the authors' abstract. Three months following autologous DPC grafting showed alveolar bone of the patients had optimal vertical repair and a full restoration of periodontal tissue to the second molars.

Honor

Steven Chan, DDS

Steven Chan, DDS, past president of the California Dental Association and one of the founders of the California Dental Association Foundation, recently was elected as a regent for the American College of Dentists. Chan represents California, Nevada, Arizona, New Mexico, and Hawaii to the College, the oldest national honor society for dentistry in the country.

The College recognizes meritorious contributors to society and/or the profession. Only 3.5 percent of dentists are eligible to be nominated. The College's mission is to advance excellence, ethics, professionalism, and leadership for the profession. Chan also serves as the chair of the Ohlone Community College's Bond Oversight Committee.

UPCOMING MEETINGS

2010	
April 11–17	United States Dental Tennis Association, Amelia Island Plantation, Fla., dentaltennis.org.
April 26–28	National Oral Health Conference, St. Louis, Mo., nationaloralhealthconference.com.
May 13–16	*CDA Presents The Art and Science of Dentistry*, Anaheim, 800-CDA-SMILE (232-7645), cda.org.
Sept. 9–11	*CDA Presents The Art and Science of Dentistry*, San Francisco, 800-CDA-SMILE (232-7645), cda.org.
Nov. 7–13	United States Dental Tennis Association, Grand Wailea, Hawaii, dentaltennis.org.
2011	
May 12-15	*CDA Presents* the Art and Science of Dentistry, Anaheim, 800-CDA-SMILE (232-7645), cda.org.
Sept. 22-24	*CDA Presents* the Art and Science of Dentistry, San Francisco, 800-CDA-SMILE (232-7645), cda.org.

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

Dental Students Game for Learning

Faculty members and students at the Medical College of Georgia have developed a computer game as a way for dental schools to reinforce lessons in decision-making, treatment protocols, and even diagnostics.

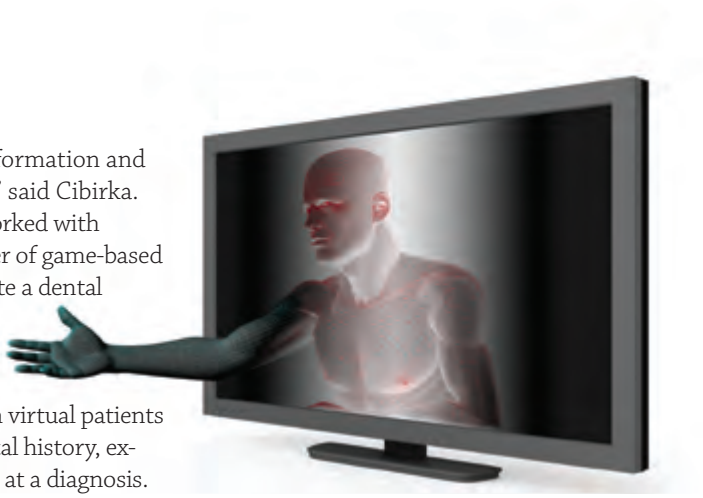
According to an article in the college's publication, *Word of Mouth*, instructional effectiveness, patient safety, and a fun learning environment, were the priorities of Roman Cibirka, DDS, MS, director of the project, who also is the college's vice president for instruction and enrollment.

"There's a lot of enthusiasm in the global dental and medical communities to use virtual reality and simulation as a tool to convey and reinforce information and ensure competency levels," said Cibirka.

Cibirka and his team worked with BreakAway, Ltd., a developer of game-based training technology, to create a dental simulation game that uses multiple conditions and clinical scenarios that allow students interact with virtual patients by asking about their medical history, examining them, and arriving at a diagnosis. The patients have differing personalities, which add to the realism of the game.

"It's realistic," Cibirka said. "If the student doesn't place anesthesia in the right spot, the patient screams."

Twenty dental schools currently are evaluating the program.



CDA JOURNAL, VOL 38, Nº2

ADA Asks FDA to Regulate, Classify Materials for Tooth Whitening

The American Dental Association has asked the U.S. Food and Drug Administration to create appropriate classifications for tooth-whitening chemicals.

Citing concern about the safety of whitening products that are often administered without the benefit of professional consultation or examination by a dentist, the ADA said that the application of chemically based tooth whitening or bleaching agents can harm teeth, gums, and other tissues in the mouth, according to a press release that also noted that these concerns have caused many states to bar the application of tooth-whitening products in nondental settings.

"The tremendous expansion of products available directly to consumers and application of products in venues such as shopping malls, cruise ships, and salons is troubling since consumers have little or no assurance regarding the safety of product ingredients, doses, or the professional qualifications of individuals employed in these nondental settings," said Ron Tankersley, DDS, ADA president, and Kathleen O'Loughlin, DDS, MPH, ADA executive director in a letter from the ADA to the FDA.

"Application of whitening/bleaching materials is not risk-free and may not be appropriate for all dark or discolored teeth," they wrote.

"The pilot at Temple will help us understand the effectiveness of a dental health coordinator in underserved urban settings."

RON TANKERSLEY, DDS

Temple University to Train New Dental Team Member in Pilot Program

Temple University, through an agreement with the ADA, will train new dental team members in an effort to boost oral health in communities that are underserved.

The pilot program, which is the ADA model, involves using a community dental health coordinator, CDHC, to provide a limited range of preventive dental care services, including screenings and fluoride treatments, according to a press release. The CDHC also will assist patients in navigating the health system and accessing care provided by a dentist or an appropriate clinic, as well as participating educational activities to improve the oral health habits of the community.

Over the next two years, Temple University will recruit and train CDHCs from urban locations in Philadelphia, returning them to their communities to work as dental team members under the supervision of dentists.

"We are delighted to welcome Temple's participation," said Ron Tankersley, DDS, ADA president. "The pilot at Temple will help us understand the effectiveness of a dental health coordinator in underserved urban settings."

Amid Ismail, BDS, MPH, MBA, DrPH, dean of Temple University's Kornberg School of Dentistry and one of the architects of the CDHC program, said of the program, "Our aim is to ensure that the coordinator is able to bridge the gap between local cultures and health care systems."

In addition to Temple, two other pilot programs are being directed by University of Oklahoma, which is training CDHCs from rural areas; and the University of California, Los Angeles, which, in conjunction with Salish Kootenai College in Wyoming, is training students from American-Indian communities. The ADA has funded the program, training six students per site each year.

CDA PRESENTS

SHOW HIGHLIGHTS

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cda PRESENTS

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HARALD O. HEYMANN, DDS, MED

Dental Materials

Bread-and-Butter Adhesive and Restorative Dentistry	Saturday morning lecture

TERRY DONOVAN, DDS

Dental Materials/Restorative

Update in Esthetic Restorative Dentistry	Saturday morning lecture
Restoration of the Worn Dentition	Sunday lecture

KENNETH M. HARGREAVES, DDS, PHD

Endodontics

Managing the Endodontic Infection	Friday morning lecture
Regenerative Endodontics	Friday afternoon lecture
Successful Management of Acute Dental Pain	Saturday morning lecture
How to Successfully Anesthetize the "Hot" Tooth	Saturday afternoon lecture

TRICIA OSUNA, RDH, BS, FAADH

Ergonomics

Save Me — Save You! Ergonomics and Effective Patient Care	Thursday morning and Saturday afternoon lectures
What Is It? How Do I Use It? Today's Dental Products and Treatment Options	Thursday afternoon and Saturday morning lectures

THOMAS J. MCGARRY, BS, DDS, FACP, FACD

Prosthodontics/Removable

Implant Dentistry in Everyday Practice — Placement to Restoration	Friday lecture

BRIAN P. LESAGE, DDS, FAACD; EDWARD A. MCLAREN, DDS, MDC

Esthetic Dentistry


Two-Day Continuum Workshop Anaheim and San Francisco	Friday and Saturday two-day workshop

GEORGE F. PRIEST, DMD

Esthetic Dentistry

Soft Tissue Development With Provisional and Definitive Implant Restorations	Thursday morning lecture
Progressive Veneer Techniques for Optimal Esthetics	Thursday afternoon lecture
Implant Rehabilitation of Edentulous Maxillae	Friday morning lecture
A Collaborative Approach to Esthetic Outcomes in Young Patients	Friday afternoon lecture

HARALD O. HEYMANN, DDS, MED (MODERATOR); THOMAS F. BASTA, DDS; TERRY DONOVAN, DDS; MARK J. FRIEDMAN, DDS; RICHARD SIMONSEN, DDS

Failures in Dentistry Panel





Ethical Controversies in Esthetic and Restorative Dentistry	Saturday afternoon panel

TERRY TANAKA, DDS

TMD

The New Quarterback: A New 2010 Treatment Planning Playbook for the General Dentist	Friday lecture
TMD Management in 2010: Science or Smoke and Mirrors?	Saturday morning lecture
Splint Therapy: What Works, What Doesn't and Why	Saturday afternoon lecture

Your lounge for learning, networking and fun

CDA Presents is excited to bring you a dynamic and interactive area in the exhibit hall — The Spot. The contemporary lounge is The Spot for you to learn, network and have fun. You can earn C.E. credit, see new products, plan your office renovation, check your e-mail, or enjoy a cup of coffee and relax with friends.

The Spot will feature:

- An educational theater providing C.E. credits
- A wine party reception
- Product demos
- An office design center
- A live art board
- An Internet Café
- WiFi access
- C.E. stations
- Coffee and snack shop
- Cool, contemporary furniture for lounging

Experience it in Hall D of the Anaheim Convention Center, Friday and Saturday, 9:30 a.m.–5:30 p.m., Sunday 9:30 a.m.–2 p.m.

CDA Night at *Disney's California Adventure®* Park

Enjoy an exclusive party for *CDA Presents* attendees and their guests! Your evening will be filled with special attractions, food and fun! Please check cdapresents.com for details.

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FRIDAY, MAY 14

7–9 p.m. Enjoy *Disney's California Adventure®* Park
9 p.m. Park closes to the general public
9–11 p.m. Disney attractions
Fee: $65
Event #: 056

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WineFUNdamentals Wine Party Reception

Enjoy learning about wine with interactive activities at each of our wine tables – learn to distinguish the various scents and flavors in wine, practice your new skills by tasting white varietals blind, explore red wine varietals from a particular area, discover new taste sensations tasting wines paired with both cheese and chocolate, and put your new wine knowledge to the test and win some prizes playing our wine trivia game!

SATURDAY, MAY 15

Time: 4–5:30 p.m.
Location: The Spot — Exhibit Hall D
Fee: $25
Event #: 062

SCHEDULE-AT-A-GLANCE

THURSDAY, MAY 13, 2010

Required Courses	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
California Dental Practice Act (001)/$20	5-7 p.m.	ACC	Ballroom D/E	R. Thomason	2.0/I	D, H, A
Infection Control (002)/$20	7-9 a.m.	ACC	Ballroom A	N. Andrews	2.0/I	D, H, A
Corporate Forums						
Millennium Dental Technologies – Laser Periodontal Pocket Therapy – Success With Nd: YAG Lasers	9:30-11:30 a.m	ACC	304 A/B	R. Yukna	2.0/I	D, H
3M ESPE – The Power of Integration: Digitally Created Ceramic Restorations	12:30-1:30 p.m.	ACC	204 A	C. Norman	1.0/I	D
Workshops						
Hands-on Infection Control Workshop (011)/$95	9:30 a.m.-noon*	ACC	213 A	N. Andrews, J. Molinari	2.5/I	D, H, A, S, O, L
Provisional Restorations for Today's Restorative Practice (013)/$195	9:30 a.m.-12:30 p.m.*	ACC	213 C	T. McDonald	3.0/I	D, A, S, L
RM12: Framework for Positive and Effective Interactions (705)/See program book for fees.	9:30 a.m.-12:30 p.m.*	HAH	California B	C. Jansen, D. Weiss	3.0/II	G
Cast Gold Workshop (017)/$395	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	213 B	B. Small	5.0/I	D
Oral Radiology – Is Perfection Possible? (015)/$140	10 a.m.-12:30 p.m.*	ACC	213 D	B. Potter	2.5/I	H, A, S
Hands-on Infection Control Workshop (012) p.m./$95	1:30-4 p.m.*	ACC	213 A	N. Andrews, J. Molinari	2.5/I	D, H, A, S, O, L
Oral Radiology – Is Perfection Possible? (016)/$140	2-4:30 p.m.*	ACC	213 D	B. Potter	2.5/I	H, A, S
Provisional Restorations for Today's Restorative Practice (014)/$195	2-5 p.m.*	ACC	213 C	T. McDonald	3.0/I	D, A, S, L
RM12: Framework for Positive and Effective Interactions (706)/See program book for fees.	2-5 p.m.*	HAH	California B	C. Jansen, D. Weiss	3.0/II	G
Symposia						
A Triple Threat to Perio Pathogens: Laser, Micro-ultrasonics and Locally Administered Antibiotics	9:30 a.m.-noon	ACC	304 C/D	E. Lundry	2.5/I	D, H
Offering Value in Your Life and Practice: Managing Challenging Economic and Emotional Times	9:30 a.m.-noon	ACC	208 A/B	D. Lee	2.5/II	G
Secrets of Becoming a High-Performing Assistant	9:30 a.m.-noon	ACC	303 C/D	K. Valdovinos	2.5/II	A
Dental Technology and Your Practice: From CAD/CAM to Digital Impressions to Web Sites and More	10 a.m.-12:30 p.m.	ACC	206 A/B	T. Schoenbaum	2.5/I	G
A Taste of the Pankey Experience	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	303 A/B	J. Baggett, J. Fondreist, J. Kessler	2.5/I 2.5/I	G
Practice Management Gems for the Next Decade	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	205 A/B	L. Miles, et al.	None	G
Risk, Pain and Profitability: How to Successfully Implement Ergonomic Changes in Your Office	1:30-4 p.m.	ACC	303 C/D	L. Fitzpatrick	2.5/I	D, H, A, S
The Ultimate Anesthetic Experience	1:30-4 p.m.	ACC	304 A/B	A. Budenz, M. Falkel	2.5/I	D, H, S
When Airways Collide: Snoring, Sleep Apnea and Other Offensive Behaviors	1:30-4 p.m.	ACC	304 C/D	T. Morgan	2.5/I	G
Contemporary Surgical Orthodontic Treatment – An Introduction to Accelerated Osteogenic Orthodontics	2-4:30 p.m.	ACC	208 A/B	G. Eidenmuller, J. Pulver	2.5/I	G
Successful Treatments in Periodontics and Dental Implants	2-4:30 p.m.	ACC	206 A/B	P. Warshawksy	2.5/I	D, H, A, S

THURSDAY, MAY 13, 2010 (continued)

Lectures

	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
Changing Incidence, Risk Factors and Screening Modalities for Oral Cancer	9:30 a.m.-noon*	ACC	210 A/B	M. Cruz, D. Wong	2.5/I	D, H, A, O
Save Me – Save You! Ergonomics and Effective Patient Care	9:30 a.m.-noon	ACC	Ballroom D/E	T. Osuna	2.5/I	D, H, A, O, S, M
Soft Tissue Development With Provisional and Definitive Implant Restorations	9:30 a.m.-noon	ACC	204 B/C	G. Priest	2.5/I	D, A, S, L
Accelerate Your Practice	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	209 A/B	S. Pardue	2.5/II 2.5/II	D, H, A, O, S, M
Emerging Trends in Periodontics	10 a.m.-12:30 p.m.	ACC	Ballroom B	J. Grisdale	2.5/I	D, H, A, S, O
Principle-Based Dental Hygiene and Treatment Planning: Getting Great Results One Patient at a Time	10 a.m.-12:30 p.m.	ACC	207 C/D	K. Miller	2.5/I	D, H, A, O
Advanced Practice Management for Every Dental Practice	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	Ballroom A	L. Malcmacher	2.5/II 2.5/II	D, H, A, O, S, M
Management Musts for a Healthy Practice: Best Practice Models for Maximizing Insurance and Attracting and Inspiring Patients to Say "Yes"	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	207 A/B	A. Morgan	2.5/II 2.5/II	D, H, A, O, M
The Missing Link in Clinical Dentistry: Effective Caries Control	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	Ballroom C	H. Ngo	2.5/I 2.5/I	D, H, A, O , S
Changing Incidence, Risk Factors and Screening Modalities for Oral Cancer	1:30-4 p.m.*	ACC	210 A/B	M. Cruz, D. Wong	2.5/I	D, H, A, O
Progressive Veneer Techniques for Optimal Esthetics	1:30-4 p.m.	ACC	204 B/C	G. Priest	2.5/I	D, H, A, S, O, L
What Is It? How Do I Use It? Today's Dental Products and Treatment Options	1:30-4 p.m.	ACC	Ballroom D/E	T. Osuna	2.5/I	D, H, A, O, S, M
Good Vibrations: Implementing the Power Scaling Advantage to Ensure Great Clinical Results and Huge Patient Benefit	2-4:30 p.m.	ACC	207 C/D	K. Miller	2.5/I	D, H
Implant Therapy 101 for the Dental Hygienist	2-4:30 p.m.	ACC	Ballroom B	J. Grisdale	2.5/I	D, H, A, S, O

FRIDAY, MAY 14, 2010

Special Events

Exhibit Hall Grand Opening	9:30 a.m.	ACC	Exhibit Hall			G
Lunch With Terry T. Tanaka, DDS (063)/$70	12:30-1:30 p.m.	HAH	Laguna B	T. Tanaka		D
CDA Night at Disney's California Adventure Park (DCA) (056)/$65	7-11 p.m.	DCA Park				G

Required Courses

California Dental Practice Act (003)/$20	7-9 a.m.	ACC	Ballroom D/E	A. Curley	2.0/I	D, H, A
Infection Control (004)/$20	5-7 p.m.	ACC	Ballroom A	N. Andrews	2.0/I	D, H, A

Corporate Forums

Invisalign – Invisalign Clear Essentials I (054)/$1,695	8 a.m.-5 p.m. (Break noon-1 p.m.)	ACC	208 A/B	P. Ataii	6.0/I	D, H, A
Ultradent Products Inc. – Technological Resources and Biological Concepts in Minimally Invasive Endodontics	8:30-11:30 a.m.	ACC	205 A/B	R. Leonardo	3.0/I	D
Discus Dental – Revelations in Endodontics: Clinical Applications	10 a.m.-1 p.m.*	ACC	206 A/B	M. Cobin	3.0/I	D, S
Colgate – Dental Hypersensitivity – New Management Approaches	2-4 p.m.	ACC	205 A/B	E. Delgado, D. Hamlin	2.0/I	D, H, A, S
Discus Dental – Revelations in Endodontics: Clinical Applications	2-5 p.m.*	ACC	206 A/B	M. Cobin	3.0/I	D, S

KEY * Course Repeats **ACC** Anaheim Convention Center **HAH** Hilton Anaheim Hotel **DCA Park** Disney's California Adventure Park
D Dentist **H** Hygienist **A** Assistant **S** Dental Student **G** General **O** Office Staff **L** Lab Tech
M Misc. (periodontists, endodontists, accountants, specialists, spouse)

FRIDAY, MAY 14, 2010 (continued)

Workshops

	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
The Wonderful World of Lasers in Dentistry (021)/$25	8:30-11 a.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D
Practice Transition Track – Preparing for Your Practice Opportunity – Junior dentists (033)/$75	8:30 a.m.-2 p.m. (Break 11-11:30 a.m.)	HAH	Huntington A	W. Van Dyk, et al.	None	D (less than 10 years of practice)
Practice Transition Track – Preparing for Your Practice Opportunity – Senior dentists (034)/$75	8:30 a.m.-2 p.m. (Break 11-11:30 a.m.)	HAH	Huntington C	A. Wiederman, et al.	None	D (more than 10 years of practice)
Mastering Digital Dental Photography: What You Need to Know to Get the Job Done (031)/$195	9:30 a.m.-12:30 p.m.*	ACC	210 B	S. Snow	3.0/I	D, H, S, L
RM12: Framework for Positive and Effective Interactions (707)/See program book for fees.	9:30 a.m.-12:30 p.m.*	HAH	California B	C. Jansen, D. Weiss	3.0/II	G
Occlusion and Esthetics Participation Course (026)/$195	9:30 a.m.-12:30 p.m.*	ACC	213 C	T. McDonald	3.0/I	D
Crown Lengthening Workshop (020)/$595	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	210 C	J. Grisdale	5.0/I	D
Exceptional Esthetics – a Hands-on Participation Course (030)/$395	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	213 B	B. Small	5.0/I	D
Two-Day Continuum (024)/$850 (Anaheim only) or (025)/$1,500 (Both Anaheim and San Francisco)	9:30 a.m.-5 p.m. (Break 12:30-2 p.m.)	ACC	213 A	B. LeSage, E. McLaren	6.0 Th. 6.0 Fr./I	D
Oral Radiology – Is Perfection Possible? (028)/$140	10 a.m.-12:30 p.m.*	ACC	213 D	B. Potter	2.5/I	H, A, S
Great New Products for Your Practice in 2010 (018)/$45	10 a.m.-1 p.m.*	ACC	Exhibit Hall D	J. Blaes	3.0/I	D
The Wonderful World of Lasers in Dentistry (022)/$25	11:30 a.m.-2 p.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D
Oral Radiology – Is Perfection Possible? (029)/$140	2-4:30 p.m.*	ACC	213 D	B. Potter	2.5/I	H, A, S
Mastering Digital Dental Photography: What You Need to Know to Get the Job Done (032)/$195	2-5 p.m.*	ACC	210 B	S. Snow	3.0/I	D, H, S, L
Occlusion and Esthetics Participation Course (027)/$195	2-5 p.m.	ACC	213 C	T. McDonald	3.0/I	D
RM12: Framework for Positive and Effective Interactions (708)/See program book for fees.	2-5 p.m.*	HAH	California B	C. Jansen, D. Weiss	3.0/II	G
The Wonderful World of Lasers in Dentistry (023)/$25	2:30-5 p.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D
Great New Products for Your Practice in 2010 (019)/$45	2:30-5:30 p.m.*	ACC	Exhibit Hall D	J. Blaes	3.0/I	D

Lectures

Implant Rehabilitation of Edentulous Maxillae	9:30 a.m.-noon	HAH	California C	G. Priest	2.5/I	D, A, S, L
Overcoming the CSI Effect	9:30 a.m.-noon*	ACC	Ballroom A	T. Gonzales	2.5/I	G
Third-Party Payer Administration of Patients' Benefits and Reimbursement	9:30 a.m.-noon	ACC	207 A/B (Room Change)	G. Alterton, G. Dougan	2.5/II	D, O
TMD and Craniofacial Pain Made Easy	9:30 a.m.-noon*	ACC	Ballroom C	J. Spencer	2.5/I	G
Update in Pediatric Dentistry: Lasers, Trauma and Beyond	9:30 a.m.-noon	ACC	303 A/B	F. Margolis	2.5/I	D
Implant Dentistry in Everyday Practice – Placement to Restoration	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	304 C/D	T. McGarry	2.5/I 2.5/I	D, H, A, L
Implementing Practice Solutions Into Your Practice: Creating a Culture of Inspiration, Accountability and Growth	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	209 A/B	A. Morgan	None	D, H, A, S, O, M
The New Quarterback: A New 2010 Treatment Planning Playbook for the General Dentist	9:30 a.m.-4:30 p.m. (Break noon-2 p.m.)	HAH	Pacific C	T. Tanaka	2.5/I 2.5/I	D, H, A, S, L
Marketing Your Practice Online	10 a.m.-noon	ACC	204 A	L. McCollough	None	G
CAMBRA Part I – Stop Defending and Start Offending Mutans Streptococci	10 a.m.-12:30 p.m.	ACC	204 B/C	B. Novy	2.5/I	D, H, A, S, O, M

KEY * Course Repeats **ACC** Anaheim Convention Center **HAH** Hilton Anaheim Hotel **DCA Park** Disney's California Adventure Park
D Dentist **H** Hygienist **A** Assistant **S** Dental Student **G** General **O** Office Staff **L** Lab Tech
M Misc. (periodontists, endodontists, accountants, specialists, spouse)

FRIDAY, MAY 14, 2010 (continued)

Lectures

	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
Dental Implant Failure: Diagnosis and Management	10 a.m.-12:30 p.m.*	ACC	304 A/B	D. Ehsan	2.5/I	D, S
Emerging Infectious Diseases	10 a.m.-12:30 p.m.*	HAH	California A	J. Molinari	2.5/I	D, H, A, S, O, L
Managing the Endodontic Infection	10 a.m.-12:30 p.m.	ACC	Ballroom B	K. Hargreaves	2.5/I	D, S
Preservation and Restoration of Tooth Structure	10 a.m.-12:30 p.m.*	HAH	Pacific A	H. Ngo	2.5/I	D, H, S
To Use or Not to Use: When Is the Question? Seamless Product and Technology Integration for the Dental Hygienist	10 a.m.-12:30 p.m.	ACC	207 C/D	K. Miller	2.5/I	D, H
Wait! I Still Feel That! Problem-Solving the Delivery of Local Anesthesia	10 a.m.-12:30 p.m.*	HAH	California D	A. Budenz	2.5/I	D, H, S
Achieve Endodontic Excellence: Shaping, Cleaning, Disinfecting and Obturation	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	303 C/D	C. Goodis	2.5/I 2.5/I	D, H, A, O
Drugs, Bugs and Dental Products – What to Prescribe	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	Ballroom D/E	P. Jacobsen	2.5/I 2.5/I	D, H, A, S, O
The Hottest Topics in Dentistry	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	HAH	Pacific D	L. Malcmacher	2.5/II 2.5/II	D, H, A, S, O, M
Peer Review – a Membership Benefit	1-4 p.m.	ACC	204 A	M. Thomas	3.0/II	D, H, A, O
The Elimination of Optional Adult Dental Services – An Open Dialogue With Denti-Cal	1-5 p.m.	ACC	207 A/B	T. Holloway, et al.	4.0/I	D, S
A Collaborative Approach to Esthetic Outcomes in Young Patients	1:30-4 p.m.	HAH	California C	G. Priest	2.5/I	D, H, A, S, L, O
Overcoming the CSI Effect	1:30-4 p.m.*	ACC	Ballroom A	T. Gonzales	2.5/I	G
Tricks or Treatments: Techniques for Treating Special Needs Patients	1:30-4 p.m.	ACC	303 A/B	F. Margolis	2.5/I	D, H, A, S
TMD and Craniofacial Pain Made Easy	1:30-4 p.m.*	ACC	Ballroom C	J. Spencer	2.5/I	G
CAMBRA Part II – How to Rid Yourself (and Your Patients) of Dental Caries	2-4:30 p.m.	ACC	204 B/C	B. Novy	2.5/I	D, H, A, S, O, M
Dental Implant Failure: Diagnosis and Management	2-4:30 p.m.*	ACC	304 A/B	D. Ehsan	2.5/I	D, S
Emerging Infectious Diseases	2-4:30 p.m.*	HAH	California A	J. Molinari	2.5/I	D, H, A, S, O, L
Personalized Periodontal Therapy: Incorporating Oral Systemic Medicine Into Daily Practice	2-4:30 p.m.	ACC	207 C/D	K. Miller	2.5/I	D, H, A, O
Preservation and Restoration of Tooth Structure	2-4:30 p.m.*	HAH	Pacific A	H. Ngo	2.5/I	D, H, S
Regenerative Endodontics	2-4:30 p.m.	ACC	Ballroom B	K. Hargreaves	2.5/I	D, S
Wait! I Still Feel That! Problem-Solving the Delivery of Local Anesthesia	2-4:30 p.m.*	HAH	California D	A. Budenz	2.5/I	D, H, S

SATURDAY, MAY 15, 2010

Special Events

Lunch With Harald O. Heymann, DDS, MEd (064)/$70	Noon-1 p.m.	HAH	Laguna B	H. Heymann	None	D
WineFUNdamentals Wine Party Reception (062)/$25	4-5:30 p.m.	ACC	Exhibit Hall D The Spot		None	

Required Courses

California Dental Practice Act (005)/$20	7-9 a.m.	ACC	Ballroom D/E	A. Curley	2.0/I	D, H, A
Infection Control (006)/$20	5-7 p.m.	ACC	Ballroom D/E	E. Cuny	2.0/I	D, H, A

Corporate Forums

Invisalign – Invisalign Clear Essentials II (055)/$350	8 a.m.-4 p.m.	ACC	206 A/B	E. Kuo	6.0/I	D, H, A
Practice Works – Understanding Cone Beam Computed Tomography	1:30-2:30 p.m.	ACC	210 A	D. Gane	1.0/I	D, H, A
Millennium Dental Technologies – The ABCs of Informed Consent	2-4 p.m.	ACC	205 A/B	E. Zinman	2.0/I	D, H

SATURDAY, MAY 15, 2010 (continued)

Workshops

	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
The Wonderful World of Lasers in Dentistry (035)/$25	8:30-11 a.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D
CAMBRA Workshop: Taking Your Practice to the Next Level (047) DDS, (048) RDH/RDA/See program book for fees.	9 a.m.-noon*	ACC	208 A/B	D. Gerger	3.0/I	D, H, A
Dentistry for Tots and Space Maintainers (039)/$195	9:30 a.m.-noon*	ACC	213 B	F. Margolis	2.5/I	D
Implants and Removable Prosthodontics (041)/$195	9:30 a.m.-noon*	ACC	213 D	T. McGarry	2.5/I	D
RM12: Framework for Positive and Effective Interactions (709)/See program book for fees.	9:30 a.m. -12:30 p.m.	HAH	California B	C. Jansen, D. Weiss	3.0/II	G
Establish the Office of Your Dreams (046)/$75	9 a.m.-3:30 p.m.	HAH	Pacific B	Industry Speakers	None	D
Crown Lengthening Workshop (038)/$595	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	210 C	J. Grisdale	5.0/I	D
Two-Day Continuum – Day 2 of Anaheim Program (024)/$850 (Anaheim only) or (025)/$1,500 (Both Anaheim and San Francisco)	9:30 a.m.-5 p.m. (Break 12:30-2 p.m.)	ACC	213 A	B. LeSage, E. McLaren	6.0 Th. 6.0 Fr./I	D
Basic Training – Equipment Care and Repair (044)/$175	10 a.m.-12:30 p.m.*	ACC	213 C	T. Yaeger, Sr. T. Yaeger, Jr.	None	D, H, A
Designing the Perfect Smile (043)/$385	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	210 B	S. Snow	5.0/I	D, S, L
The Wonderful World of Lasers in Dentistry (036)/$25	11:30 a.m.-2 p.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D
CAMBRA Workshop: Taking Your Practice to the Next Level (049) DDS, (050) RDH/RDA/See program book for fees.	1-4 p.m.*	ACC	208 A/B	D. Gerger	3.0/I	D, H, A
Dentistry for Tots and Space Maintainers (040)/$195	1:30-4 p.m.*	ACC	213 B	F. Margolis	2.5/I	D
Implants and Removable Prosthodontics (042)/$195	1:30-4 p.m.*	ACC	213 D	T. McGarry	2.5/I	D
Basic Training – Equipment Care and Repair (045)/$175	2-4:30 p.m.*	ACC	213 C	T. Yaeger, Sr. T. Yaeger, Jr.	None	D, H, A
The Wonderful World of Lasers in Dentistry (037)/$25	2:30-5 p.m.*	ACC	Exhibit Hall D	D. Coluzzi	2.5/I	D

Lectures

Emergency Preparedness: The Role of Dental Professionals	8 a.m.-noon	ACC	210 A	A. Cardoza, J. Galligan	4.0/I	D, H
How to Effectively Deal With the Media	8:30-10 a.m.	HAH	Capistrano A/B	Media Relations Expert	None	D
Bread-and-Butter Adhesive and Restorative Dentistry	9-11:30 a.m.	ACC	Ballroom A	H. Heymann	2.5/I	D, A, S
A Day in the Life of a Dental Practice	9:30 a.m.-noon	ACC	205 A/B	K. Fornelli, R. Thomason	2.5/II	D, H, A, O
Medical Emergencies in the Dental Office	9:30 a.m.-noon*	ACC	304 C/D	D. Ehsan	2.5/I	D, H, A, S, O
Overcoming Life's Goliaths and the Power of Vision	9:30 a.m.-noon	ACC	207 A/B	D. Weber	None	G
Restoration of the Worn Dentition	9:30 a.m.-noon	HAH	California C	T. Donovan	2.5/I	D, H, A, S, O, L
Successful Management of Acute Dental Pain	9:30 a.m.-noon	ACC	Ballroom B	K. Hargreaves	2.5/I	D, S
What Is It? How Do I Use It? Today's Dental Products and Treatment Options	9:30 a.m.-noon	HAH	California A	T. Osuna	2.5/I	D, H, A, O, S, M
Comprehensive Financial Planning for Dentists in the 21st Century	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	ACC	209 A/B	A. Wiederman	None	D, S, M
Drugs, Bugs and Dental Products – What to Prescribe	9:30 a.m.-4 p.m. (Break noon-1:30 p.m.)	HAH	California D	P. Jacobsen	2.5/I 2.5/I	D, H, A, S, O
Practice and Life Transitions – Estate Planning Basics	10-11 a.m.*	ACC	204 A	B. Hoffman	None	G
Esthetics, Function and Problem Solving: Developing a Predictable Pathway to Esthetic Success With Dental Implants	10 a.m.-12:30 p.m.	ACC	304 A/B	G. Perri	2.5/I	D, A, S, L
Fattening of America: What Is Dentistry's Part of the Puzzle?	10 a.m.-12:30 p.m.	ACC	303 A-D	L. Harper-Mallonee	2.5/I	D, H, A, S, O

SATURDAY, MAY 15, 2010 (continued)

Lectures

	Time	Bldg.	Room	Speaker	C.E./ Cat.	Aud.
The Dentist's Role in the Diagnosis and Treatment of Sleep-Disordered Breathing	10 a.m.-12:30 p.m.*	ACC	Ballroom C	J. Spencer	2.5/I	D, H, A, S, O, L, M
TMD Management in 2010: Science or Smoke and Mirrors?	10 a.m.-12:30 p.m.	HAH	Pacific C	T. Tanaka	2.5/I	D, H, A, O, M
Oral Art and Design: The Synergy of Esthetics and Function	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	207 C/D	M. Sesemann	2.5/I 2.5/I	D, A, S, L
Achieve Endodontic Excellence: Advanced Endodontic Cases and Retreatment	10 a.m.-4:30 p.m. (Break 12:30-2 p.m.)	ACC	204 B/C	C. Goodis	2.5/I 2.5/I	D, H, A, O
Protecting Your Practice … and Your Patients	noon-1 p.m.	ACC	204 A	J. Ingalls, J. Caluza	1.0/II	D, O M
How to Successfully Anesthetize the "Hot" Tooth	1:30-4 p.m.	ACC	Ballroom B	K. Hargreaves	2.5/I	D, S
Save Me, Save You! Ergonomics and Effective Patient Care	1:30-4 p.m.	HAH	California A	T. Osuna	2.5/I	D, A, S, L
Medical Emergencies in the Dental Office	1:30-4 p.m.*	ACC	304 C/D	D. Ehsan	2.5/I	D, H, A, S, O
Spread So Thin You Can See Through Me – Time Management and Personal Organization	1:30-4 p.m.	ACC	207 A/B	D. Weber	None	G
Ethical Controversies in Esthetic and Restorative Dentistry	1:30-4:30 p.m.	HAH	California C	H. Heymann, et al.	3.0/I	D, H, A, S, L
Practice and Life Transitions – Estate Planning Basics	2-3 p.m.*	ACC	204 A	B. Hoffman	None	G
Five Simple Tips to Utilize Social Media in Marketing Yourself and Your Practice	2-3:30 p.m.	HAH	Capistrano A/B	C. McNulty	None	D
Esthetics, Function and Problem Solving: Identifying the Treatment Skills to Facilitate Implant Restoration From a Single Unit to a Full Mouth Reconstruction	2-4:30 p.m.	ACC	304 A/B	G. Perri	2.5/I	D, A, S, L
The Dentist's Role in the Diagnosis and Treatment of Sleep-Disordered Breathing	2-4:30 p.m.*	ACC	Ballroom C	J. Spencer	2.5/I	G
Splint Therapy: What Works, What Doesn't and Why	2-4:30 p.m.	HAH	Pacific C	T. Tanaka	2.5/I	D, H, A, L
You Are What You Eat … and Drink	2-4:30 p.m.	ACC	303 A-D	L. Harper-Mallonee	2.5/I	D, H, A, S, O

SUNDAY, MAY 16, 2010

Required Courses

California Dental Practice Act (007)/$20	7-9 a.m.	ACC	Ballroom D/E	R. Thomason	2.0/I	D, H, A
Infection Control (008)/$20	10 a.m.-noon	ACC	Ballroom D/E	E. Cuny	2.0/I	D, H, A

Workshops

Achieve Endodontic Excellence – Hands-on Course (052)/$395	8:30 a.m.-12:30 p.m.	ACC	213 B	C. Goodis	4.0/I	D, H, A, S, O, L
Pressure Thermoforming Appliances for the General Practice (053)/$195	8:30 a.m.-12:30 p.m.	ACC	213 C	R. Padilla	4.0/I	D, H, A, S, L

Lectures

Healthy Mouth, Healthy Body – Healthy Practice!	8:30 a.m.-noon	ACC	Ballroom A	L. Harper-Mallonee	3.5/I	D, H, A, O, S
Overcoming the CSI Effect	9 a.m.-12:30 p.m.	ACC	Ballroom C	T. Gonzales	3.5/I	G
Some Days You Are the Pigeon, Some Days the Statue	9 a.m.-12:30 p.m.	ACC	204 B/C	D. Weber	None	G
Update in Esthetic Restorative Dentistry	9:30 a.m.-12:30 p.m.	ACC	Ballroom B	T. Donovan	3.0/I	D, H, A, S, O, L

KEY * Course Repeats **ACC** Anaheim Convention Center **HAH** Hilton Anaheim Hotel **DCA Park** Disney's California Adventure Park
D Dentist **H** Hygienist **A** Assistant **S** Dental Student **G** General **O** Office Staff **L** Lab Tech
M Misc. (periodontists, endodontists, accountants, specialists, spouse)


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The Obsolescence of Formocresol

BRADLEY LEWIS, DDS

ABSTRACT Concern has existed for almost 10 years regarding the safety and efficacy of formaldehyde-based medicaments like formocresol in dentistry. Formocresol has been shown to be therapeutically outdated for decades. While the use of formocresol around the world continues to drop, it still is utilized in alarmingly high rates, an age-old bias that is unsubstantiated by overall academic research. Formaldehyde remains a genotoxic and carcinogenic problem worldwide. The most recent articles are discussed in light of the need to abandon formocresol.

AUTHOR

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This paper is intended to provide a current review of the literature, which generally reinforces the notion that formocresol is an archaic medicament and its associated applications deleterious, causing worldwide concern and a call for its elimination.[1] Yet, defense of formocresol use continues.[2]

In 1981, this author published the original compendium of research dealing specifically with the use of the carcinogens formaldehyde, cresol, and paraformaldehyde in endodontic procedures, aimed at all general practice clinicians and specialists.[3-5] The original two-year project started a debate that continues: Why haven't we eliminated formaldehyde-containing medicaments like formocresol from the dental armamentarium? The addition of cresol to the compound had only increased the deleterious effects.

Paraformaldehyde paste was also found unacceptable, both as a medicament and part of an endodontic procedure that did not utilize a full pulpectomy. An updated version of the 1981 article, published in 1998 for the millennium, reviewed separately the '80s and '90s research for carcinogenicity and the then-recent research on formocresol, adding 71 references to original 115.[6] Several letter exchanges have occurred in the journals since 1981.[7,8] The most recent ones were published in several journals.[9-13]

Formocresol Today

Despite the hundreds of articles that have supported the mutagenicity (genotoxicity), carcinogenicity, and toxicity of formaldehyde, formocresol is still used today in full strength by an alarming number of clinicians around the world.[14] Formocresol is widely accepted for vital

pulpotomy. The simple definition of vital pulpotomy involves the surgical amputation of the coronal portion of exposed vital pulp, and the placement of a dressing over the exposed, healthy pulp stumps.

Despite the overwhelming body of research, some specialty groups still consider formaldehyde as a suitable dressing. Ninety-two board-certified pediatric dentists recently responded to a questionnaire. Of them, the vast majority, some 73 percent, still used formocresol; 28 percent were still using a full-strength formulation. The group ignored the adverse effects of formaldehyde-based medicaments.[15]

At the beginning of 2008, Dunston and Coll repeated a 1997 survey that questioned the undergraduate pediatric dentistry chairs and board-certified pedodontists who had been surveyed in 2005. Diluted formocresol was still used frequently, but was now down to 54 percent, with an increased usage of ferric sulphate and calcium hydroxide as alternative medicaments.

Clinicians should be advised that using formocresol is not recommended by the American Association of Endodontists and the American Academy of Pediatric Dentistry. Some program directors and diplomats ignore the majority recommendations and understanding of their own specialty organization.[16] Seal and Glickman have reported on the November 2007 pulp therapy symposium of those two organizations. One of the clear understandings held between those pulp therapy specialty groups, a result of chi-2 tests given before and after the symposium, is that formocresol should not be a primary tooth pulpotomy agent. Mineral trioxide is the acceptable replacement.[17]

Ironically, the formocresol pulpotomy is still the most frequently used procedure for asymptomatic caries that endangers the pulp chamber in primary teeth. Indirect pulp therapy, IPT, has been show to be an effective alternative to the full pulpotomy. Still, within the United States, the full formocresol pulpotomy remains the most popular, even though it may be obsolete and should not be the first choice instead of IPT.[18]

Dosage is also a problem. Years ago, the manufacturers of Buckley's formocresol explained to this author that the percentages listed on the packaging were an estimate and variations sold around the world could differ in its formaldehyde component by more than 10 percent. Some authors, Milnes, for example, have wrongly equated mg with ppm. 1 mg/liter is 1 ppm. Using the archaic method of squeezing a No. 4 pellet, the resulting dose estimates reported (utilizing a 1:5 dilution of formocresol) a range from .02 to 1 mg per dose.

DESPITE THE overwhelming body of research, some specialty groups still consider formaldehyde as a suitable dressing.

Authors like Milnes who defend the use of formocresol admit that the dose is clearly unknown and it remains an important area for future research.[19] Proponents of this type of methodology have never utilized reliable and reproducible studies, advantaged by a simple mean and standard deviation.[20]

Much of the supportive literature for the continuance of formocresol is supported by pharmaceutical chemists. Since formaldehyde is so prevalent in our daily lives, it matters little if we introduce a little more uncalculated dose into the systems of children. For some authors, formaldehyde released into the system poses little concern when juxtaposed against the undesirable amounts already in the food and environment.[21] Milnes, in a minority perspective, has written that since antibiotics are used frequently and cause death, why should we be concerned about formaldehyde?[19] As doctors, we should be trying to reduce the amounts of potentially harmful medicaments delivered to our patients, particularly when so many alternatives exist.

Genotoxicity and Carcinogenicity

There is overwhelming worldwide concern about the risk of environmental mutagens and carcinogens like formaldehyde to children.[22] For decades, increases in cancer have been linked to mutagenic and carcinogenic agents. Since June 2004, the International Agency for Research on Cancer has reclassified formaldehyde as a known human carcinogen.[23] Recently, formaldehyde was strongly associated with leukemia while generally accepted as a direct cause of nasopharyngeal cancer.[24]

Despite any clinical success in its usage, it is currently accepted that attention must be paid to the mutagenic (genotoxic) and carcinogenic properties of medicaments. In early 2008, Ribeiro reviewed the need to consider genotoxicity in the hope of improving our approach to general oral health while being certain that we are not contributing to oral carcinoma.[25] Formaldehyde medicaments are capable of causing noxious activity on the actual genetic makeup of a cell. Strangely, much of Ribeiro's work with in vitro single cell gel (comet) assay indicates little if any genetic damage by formocresol, and he is quoted in recent articles.[26-28] However, Hagiwara, using Syrian hamster embryo (SHE) cells, found that the

percentages of cells with chromosomal aberrations, polyploidy or endoreduplication were increased by formocresol.

The dosage in the Hagiwara study was 14,090 times less strength than the standard used in clinical pulpotomy treatment on children.[29] Nishimura et al. demonstrated genotoxic events using .001 percent formalin — the dose of formaldehyde in Buckley's formocresol is 19,000 times greater.[30] Formaldehyde and m-cresol still show genotoxic effects to mammalian cells in other studies using SHE.[31] It is clear this area needs further study.

Liver toxicity associated with formocresol shows mixed results, depending upon the animal studies. Some rat studies have shown little if any effect on the liver.[32] In 2000, Hamaguchi showed the genotoxicity of seven dental antiseptics, among them m-cresol and formaldehyde. Again utilizing SHE, Hamaguchi concluded that both medicaments were genotoxic to mammalian cells.[33] Formaldehyde is a genotoxic substance. Studies show that formaldehyde induces DNA-protein cross-linking causing DNA lesions. Recent studies have shown that formaldehyde induces mutations in mouse lymphoma assay. Mutant colonies are created, likely by inducing chromosomal aberrations.[34]

Using human buccal cells, Lu et al. demonstrated DNA breaking and cross-linking activity. He concluded that the results of gaseous formaldehyde with the comet test indicated that formaldehyde increased the possibility of cancer at high levels.[35] The difficulty in interpreting the individual genotoxic effect of a single pulpotomy is obviously very difficult and can't be done in vivo. Looking at the peripheral blood cells of a single child who has had a formocresol pulpotomy is interesting, but studies with statistical significance would mean long-term human studies.[36] Outside of dentistry, OSHA has been making every effort to see that formaldehyde is monitored properly.[37]

The more detailed arguments at the cellular and DNA/chromosomal level are beyond the scope of this article. Multitudes of supportive research exist to make arguments based on extrapolation of data to nonrelated clinical fields, sometimes a faulty link, particularly when like dosage and exposure data are unavailable in pedodontics and endodontics. Discussion of cancer research methodologies and assays in individual medical research specialty articles should be left to other literature venues and international cancer experts, and perhaps should no longer be dissected in reviews by dental clinicians.

USING THE established standards of clinical and radiograph success, MTA outshined formocresol, FS, and CH.

Current Pulpotomy Medicaments

For many years, clinicians have substituted a variety of medicaments for formocresol. The potpourri of historic 19th and early 20th century concoctions have often proved as effective as formocresol. Today, modern cements and chemical mixtures have been added. The use of older medicaments like zinc oxide is still being tested, with generally favorable outcomes.[38]

Caceda has developed a contemporary technique that utilizes a resin-based composite filling material — fast-setting ZOE Temrex cement, a zinc oxide and eugenol (oil of cloves) product, but still performs the formocresol pulpotomy.[39] This article illustrates the reluctance of clinicians to omit formocresol, even from newer procedures that may not require it, in this case because of the presence of ZOE.

Vargas and others haves shown success with sodium hypochlorite as a pulpotomy medicament.[40,41] Even a "green" approach exists, utilizing 19th century essential oil cinnamaldehyde, from cinnamon, with promising results in rat pulp capping when compared to formocresol.[42]

Generally, the popular medicaments are ferric sulphate, calcium hydroxide and mineral trioxide aggregate, known in the literature as FS, CH, MTA.[43] In 2008, a clinical study by Sonmez et al. found nearly equal success rates for FS as for the ubiquitous formocresol.[44] While slightly lower success rates were shown for MTA and CH, it, like so many clinical articles around the world, makes any well-meaning clinician take pause and wonder why formocresol is still the yardstick so many years after it was discredited. Sophisticated research, like that of Ng and Messer, established composite statistical meta analysis results from a broad range of pulpotomy articles that were concerned with the efficacy of MTA, formocresol, FS, and CH.

Using the established standards of clinical and radiograph success, MTA outshined formocresol, FS, and CH.[45] Moretti et al. found similar results in a controlled study that had up to 24 month follow-ups. CH showed a higher incidence of internal root resorption.[46] A light-cured version of CH did not fare as well as other studies and conditions.[47] Many studies have shown positive results for MTA when compared with formocresol.[48] Upon histological examination animal studies have shown superior results for MTA, white Portland cement (WPC), and beta-tricalcium phosphate

TABLE 1

Medicaments At A Glance

Medicaments	Cytotoxic	Genotoxic	Carcinogenic
Formocresol	Yes	Yes	Yes
ZOE	Low	Low	?
MTA	No	No	No
FS	Yes	Low	No
CAOH	Low	No	?

(b-TCP) over formocresol and FS.[49] Other promising possibilities include enamel matrix derivative (EMD), a material that utilizes active odontogenic protein.[50]

The majority of research at the present time points to MTA as the most popular choice because of its predictability in preserving pulpal health while promoting healing and regeneration of pulp tissue. Generally, MTA offers far better outcomes than formocresol, which contributes to post-treatment disease[51-54] (**TABLE 1**).

Recently, Bahrololoomi et al. examined the success rates of electrosurgery as opposed to the archaic formocresol pulpotomy. The failure rate in both groups did not show any statistical significance on the 70 primary molars of 5- to 10 year-olds, evidence that alternatives to medicaments should be examined and studied further.[55] Lasers, of course, are making headway as a progressive alternative to formocresol.[56,57]

Conclusion

Revival of age-old remedies as far reaching as chicken soup are often advantageous, a well-known, effective, innocuous, and sometimes scientific adjunct for a variety of ailments.[58] The same cannot be said of long-standing formocresol due to its harmful effects and lack of scientific support.

Formocresol is very likely no longer suitable for use in dentistry, with emphasis on its applications in children's dentistry. In 2006, Fuks aptly concluded after examining a review of the pulpotomy literature from 1966-2005, "More high quality, properly planned prospective studies are necessary ..." although noted that MTA is currently the most favorable choice.[59] As many others before, Fuks reported in 2008 that suitable alternatives to formocresol exist.[60]

The decades of research have identified old-fashioned formaldehyde products like formocresol as problematic because of its toxicity, carcinogenicity, and genotoxicity. There are several viable and superior noninvasive clinical alternatives. Formocresol should be abandoned. ■■■■

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In Vitro Assessment of Human Dentin Wear Resulting From Toothbrushing

ALENA KNEZEVIC, DDS. PHD; INDRA NYAMAA, DDS; ZRINKA TARLE, DDS, PHD; AND KARL-HEINZ KUNZELMANN, DDS, PHD

ABSTRACT It is well-recognized that toothbrushing is the most widely used method for daily oral hygiene maintenance. This in vitro study examines dentin surface wear resulting from the use of an oral hygiene device in a controlled oral condition. Powered toothbrushes produce less wear than manual brushes. However, depending on their design and applied forces, they can also produce varying levels of dentin wear.

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Tooth wear is a cumulative multifactorial lifetime process involving different interrelated chemical and physical processes, mainly erosion, abrasion, and attrition. For mechanical wear, most attention has been focused on toothbrushing abrasion that has been considered as an etiological factor, which has caused gingival recession, loss of hard dental tissue, and the development of cervical wedge-shaped lesions.[1]

Many variables have been suggested to influence toothbrushing abrasion: brushing technique, force of brushing, duration and frequency of brushing, type of toothbrush, especially filament stiffness.[2] There is considerable evidence that hard-tissue abrasion is a function of toothpaste.[3] While most toothpastes are above a pH that might cause erosion to either enamel or dentin, few contain abrasives that can abrade enamel. Additionally, toothbrushes alone have a little, if any, effect on dental hard tissues.[4,5]

Toothbrush manufacturers have attempted to design a toothbrush to optimize the cleaning effect while minimizing trauma of the hard and soft tissues. Some previous studies have indicated that soft filament toothbrushes produced more toothpaste abrasion of hard substrates than hard brushes.[2]

Explanation for this is that soft brushes retain more paste among the narrower diameter filaments and have a greater contact surface area with the substrate. However, increasing the filament surface and contact area could be also achieved through differences in head filament density, reducing filament stiffness or changing filament cross-section and shape.[2,3] A number of studies have measured factors influencing the wear of tooth structure

FIGURE 1. The dentin slice embedded into a model made from a self-curing material for temporary crown and bridge restorations.

FIGURE 2. Toothbrush with dentin sample mounted in the toothbrush machine.

from exposure to dentifrices and various manual- and powered-toothbrush designs.[6]

Electronic toothbrushes are now generally regarded to be more efficacious than manual toothbrushes in removing plaque and maintaining or improving gingival condition.[7] Some new studies suggested that toothbrushing with manual and power toothbrushes produces limited dentin wear in a lifetime of use.[8] Sorensen and Nguyen, and Schemehorn and Zwart found that manual and power toothbrushes appear to differ in the transportation of toothpaste and the resulting abrasion of sound dentin specimens.[6,8] They found significantly higher dentin loss produced by manual compared to powered toothbrushes.

In contrary, Efraimsen et al. found no differences in abrasion of native dentin between a conventional and an electrical toothbrush.[9] Sorensen and Nguyen concluded that increased toothbrush force increased the dentin substrate wear of tooth, whatever manual or power toothbrush is used.[6] They also concluded that wear is associated with brush design and motion, and that powered toothbrushes may produce varying levels of dentin wear.

The aim of this study was to measure dentin substrate wear in vitro caused by toothbrushing with powered toothbrushes of different load applied in comparison to manual toothbrushes.

Materials and Methods

As a dentin source, extracted human permanent teeth (either incisors, premolars or molars) with intact surface were used for the experiment. The experimental protocol was approved by the ethical committee from University of Munich/University of Zagreb, Dental School. Extracted teeth stored in physiologic saline solution with the antimicrobial agent sodium azide (NaN_3) were used. Sodium azide is a standard disinfectant and it was chosen because it has not interaction with dentin. The chosen teeth had neither caries nor restorations in the plane of the section. The teeth were sectioned with a slow-speed diamond saw with a diamond-wafering blade cooled via a water bath along the inciso-apical plane to obtain 2 mm thick dentin slices that were 3 mm wide and 10 mm long. The dentin samples were optically checked, and all samples that exhibited any irregularities like discolorations or other signs of sclerotic dentin were eliminated.

The dentin slices were embedded into a model made from a self-curing material for temporary crown and bridge restorations (Luxatemp, DMG, Hamburg, Germany) (**FIGURE 1**). To ensure adhesive contact throughout the test period, the dentin samples were pretreated with a self-etching dentin bonding agent (Prompt L-Pop, 3M-Espe, Seefeld, Germany). The surface of the specimen was sanded and finished using 400 grit, 600 grit, and, finally, 1,200 grit SiC-paper. With the exception of the valleys between the ridges, the dentin surface was co-planer to the model surface after the surface treatment.

The dentin slices were prepared in advance and assigned the randomly to the experimental groups. They were stored in a plastic bag wrapped in a wet tissue to keep the samples hydrated prior to testing. The dentin slices were embedded into the C and B (core and bridge) material 24 hours before testing to ensure that all samples had the same degree of cure of the composite to avoid differences in wear due to higher wear resistance of better-cured samples. The samples were mounted in the toothbrush machine (University of Munich, Germany) and aligned so that the brush head was in proper contact to the dentin and the center of the brush head passed over the dentin surface (**FIGURE 2**).

The following toothbrushes were compared:

1. Manual toothbrush (ADA Control) at 250 g vertical load,
2. Sonicare Elite Pro (0241 HX7800, Philips, Washington, United States) at 90 g vertical load,
3. Sonicare Elite Pro at 150 g vertical load,
4. Oral-B D17, Flexisoft EB17-4 (Braun, 3D excel Type 4736, Kronsberg, Germany) at 90 g vertical load, and
5. Oral-B D17, Flexisoft EB17-4 at 150 g vertical load.

A total of 60 specimens were made; 12 for each experimental group.

A toothbrush machine used in this study consisted of two-stepper controlled axes. For this experiment, only one of the two axes was used. The toothbrushes were mounted fixed into the slurry chamber and the dentin sample moved over the brushes. The weight of the samples was controlled and adjusted before each test with an electronic balance.

Because the powered toothbrushes were externally powered to guarantee constant conditions throughout the test, the brush heads were replaced before each test so that each specimen had a new brush head.

The horizontal excursion of the toothbrush heads was 25 mm for the

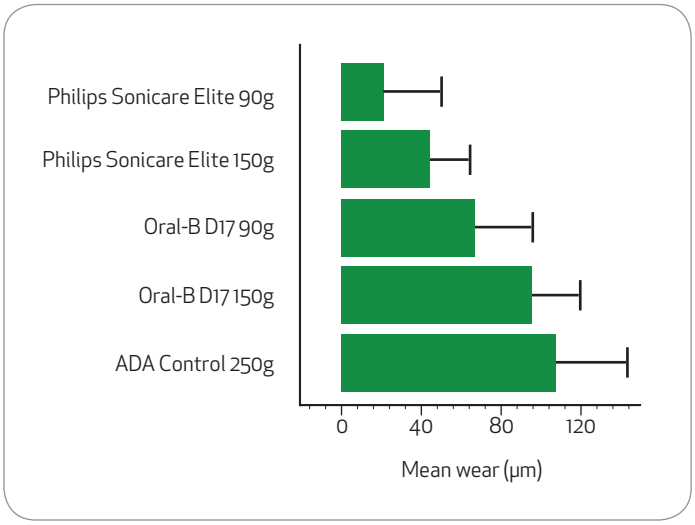

FIGURE 3. Mean wear (µm) after testing. ADA control was loaded with 250 g.

Oral-B powered toothbrush. The diameter of the toothbrush head of the Oral-B toothbrush was 12.5 mm. The amplitude of 25 mm ensured that the region of interest of the tooth slice was in contact with all bristles of the brush heads.

For the manual toothbrush and for the Sonicare Elite Pro powered toothbrush, an amplitude of 35 mm was used. By positioning the brushes immediately before the dentin specimen, it was ensured that the all bristles of the head of a toothbrush were moved over the dentin specimen with this amplitude. The software version of the toothbrush simulator is limited to testing frequency and only a testing frequency of 0.74 Hz could be achieved. Twelve-thousand five-hundred strokes to the dentin sample for the manual toothbrush and the powered toothbrushes were applied.

The brushing was done with a standardized toothpaste slurry, which was prepared from 247 g glycerin, 247 g deionized water, and 6.25 g Tragant (Merck, Darmstadt, Germany). This mixture, called a Tragant solution, can be easily stored for some days. Tragant is a suspension thickener, which is a standard component of toothpastes. The slurry containing the abrasive was freshly prepared before each test by mixing 11.2 g glycerin and 11.2 deionized water, 44.2 g Tragant solution, and 33.4 g calciumhydrogenphophate. To avoid sedimentation of the abrasive particles, the slurry was stirred regularly with an electrical mixer. The slurry was filled into the test chamber and the samples were completely covered with the slurry.

Surface Analysis

Surface analysis was done through 3-D laser triangulation.[10] The wear loss was measured with a 3-D laser Scanner (Scan-3D, Willytec, Munich, Germany). The scanner had a vertical resolution of less than 10 µm. The lateral resolution was set to 25 x 25 µm². The samples were digitized before and after the wear test.

Before scanning, the specimens' surface were covered with a special spray (Met-L-Chek Developer D-70, Helling GmbH, Spökerdamm 2, 25436 Heidgraben, Germany), just enough to cover the flat surfaces. This was the reason that on the 3-D data some dark spots could be seen in steep areas. This did not affect the result, however, because they were excluded automatically from the evaluation.

The surface of the samples was clean in an ultrasound bath before coating, with the spray immediately before the test and after the test. The two 3-D data sets were superimposed based on regions that were not worn by the toothbrush. Then a difference image was calculated and statistically analyzed. The mean height loss was used to compare the different test groups. Oneway ANOVA and Tukey post-hoc tests were used for statistical analysis. The normality for the data is tested automatically in SPSS (Kolmogorov-Smirnov test).

Results

The mean of the "mean wear" of all samples for the five test groups is shown in **FIGURE 3**. The error bars visualize the standard deviations. **TABLE 1** summarizes the corresponding numbers. In **TABLE 2** the summary analysis of variance is given. Statistical differences are identified with different columns.

Those groups that cannot be differentiated based on Tukey post-hoc test of the Oneway Anova at p=0.05 are in the same column (=homogenous subsets).

The Sonicare Elite Pro clearly has the lowest wear. The mean wear of the Sonicare Elite Pro at 90 g vertical load was significantly better than all other groups. The Sonicare Elite Pro at 150 g load was comparable to the Oral-B D17 at 90 g load but was significantly better than the manual toothbrush and the Oral-B D17 at 150 g vertical load.

Discussion

One of the main objectives of oral hygiene is to retard the plaque accumulation, which is principally accomplished by the use of toothbrushes. Unfortunately, incorrect toothbrushing habits can create lesions to both soft and hard tissues that can cause aesthetic problems or dentinal hypersensitivity with great discomfort for patients.[11]

Various variable factors are implicated in the wear of a toothbrush, which is largely determined by the forces used during brushing. These forces can vary considerably from one subject to another. Other factors, such as the methods of brushing, the geometry of

TABLE 1

Mean Wear (µm) of Dentin Surface

Group	Mean (µm)	SD (µm)
ADA control 250 g	107	36
Oral-B D17 150 g	95	24
Oral-B D17 90 g	66	26
Sonicare Elite Pro 150 g	44	20
Sonicare Elite Pro 90 g	21	29

TABLE 2

Homogenous Subsets as Identified With the Tukey Post-hoc Test

	Subset for Alpha=.05			
Subset	1	2	3	4
Sonicare Elite Pro 90 g	21			
Sonicare Elite Pro 150 g	44	44		
Oral-B D17 90 g		66	66	
Oral-B D17 150 g			95	95
ADA control				107
Significance	.309	.309	.128	.850

the tooth, and whether the individual rewets the brush in hot or cold water, thus affecting the mechanical properties of the filaments, also play a role.[12]

One of the advantages of powered toothbrushes is their ability to maintain or improve plaque control while using significantly less toothbrushing force than that required for manual toothbrushes.[13-15] Many studies have shown that higher forces are used with a manual toothbrush than a powered toothbrush. The most recent evidence suggested that the forces used with powered toothbrushes are in the range from 80 to 190 g, compared to forces in excess of 250 g that are used for manual toothbrushes.[16,17]

Many other studies observed that the pressure used during toothbrushing correlated with the amount of tissue loss.[18,19] There approximately is 100 g difference between the manual and powered toothbrushes. A study of Van der Weijden et al. showed an increase in efficacy as a brushing force was increased from 100 to 300 g.[16] The same authors concluded in another study that the relationship between force and efficacy in toothbrushing is not linear, i.e., positive correlation is established between efficacy and a force up to 400 g. Efficacy is reduced above 400 g, after which there is a negative correlation.[20] Factors inherent to the design of many powered toothbrushes allow users to apply less force, for example, load differences due to the bristles being activated by the brush motor instead of the user. Furthermore, power toothbrushes may stall if too much pressure is applied.[6]

In anterior teeth, the mean thickness of radicular dentin in the region of the cementoenamel junction varies between 1.38 and 3.06 mm. For upper and lower premolars, these values are between 1.54 and 2.21 mm, while for molars those values are between 1.42 and 3.01 mm.[21] In an in situ study, Noordmans et al. found wear rates of dentin between 4 and 35 µm/week with 100 strokes of brushing with toothpaste.[22] The substance loss was dependent on toothpaste and toothbrush type. On the other side, Zimmer et al. found surface roughness of the dentin samples after treatment ranged between 0.06 and 0.22 µm.[21] Several clinical studies quantified dentin abrasion associated with manual toothbrushes and toothpastes at about 1 µm/week.[6]

This study showed dentin wear between 21 and 66 µm at 90 g vertical load, and 45-95 µm at 150 g vertical load in the case of powered toothbrushes, and 107 µm in the case of manual tooth brushing at 250 g load and 12,500 cycles. Sorensen and Nguyen also used in their study different powered toothbrushes at 90 and 150 g load, and the authors' result is comparable to theirs when forces and abrasion are taken into account without any other characteristics of used toothbrushes.[6]

The results clarify that the correlation between load and wear is a proof for the main wear mechanism — abrasive wear. The slight deviation from linearity also shows that the bristles are no ideal springs but the tufted bristles seem to apply a nonlinear load to the abrasive particles at different weights.

The coefficient of variation is within the usual range for wear evaluations. However, the Sonicare Elite Pro at 90 g vertical load has a larger standard deviation than the mean. One possible reason could be that the authors had to switch to a new batch of calcium-hydrogenphosphate during the test. The authors could not find another obvious explanation for this result.

The equipment used in this experiment was designed to adapt to the parameters necessary for an accurate assessment of dentin wear with either manual or powered toothbrushes. When comparing dentin wear associated with toothbrush use, it is essential to consider the complexity of the toothbrush in the

design of the equipment. For example, observing the shape of the Sonicare Elite brush head at 90 g vertical load avoids contact between the short bristles and the dentin substrate can be seen. At a higher load, the shorter bristles get better contact to the dentin surface.

It is also necessary to check the surface quality of the ground and polished specimen before testing because the authors sometimes found a different wear between the dentin surface and the adjacent composite surface. The authors repeated several tests and took special care to avoid this. However, they were neither able to eliminate these differences nor find the reason for this observation. It could be a difference in elastic properties, brittleness, toughness, or composition. For this reason, the authors abandoned the approach to evaluate wear relative to a reference plane. Instead, they digitized the surface before and after testing as an alternative approach. This guaranteed that small vertical differences between dentin and composite do not affect the result.

In this study, the operating systems (e.g., oscillation, rotation, vibration) were not taken into consideration. However, some studies showed that the frequency and kind of movement of the activated electric toothbrushes influence the abrasion might be by affecting the transportation of toothpaste. Beside the frequency of brushing, a linear or rotary brushing motion are suggested as relevant for abrasion.[1] In further study, it also might be discussed whether variations in bristle design, e.g., material, length, thickness, compactness, and tip geometry, might affect toothbrushing abrasion.

Conclusion

Dentin wear as a consequence of toothbrushing procedure is associated with the load applied; increasing toothbrush force from 90 at 150 g increased the dentin substrate wear. Powered toothbrushes produced less dentin wear than manual toothbrushes. Nevertheless, depending on the design of powered toothbrushes and applied forces, different levels of dentin wear can be found. ■■■■

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Mobile Dental Clinic: An Oral Health Care Delivery Model for Underserved Migrant Children

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ABSTRACT **Objectives:** To investigate the oral health status, access, and the role of mobile dental clinics in improving the oral health of migrant children. **Methods:** Parents attending University of Southern California's Mobile Dental Clinics completed a questionnaire about their children's access to dental care. **Results:** 54 percent of children were unable to access needed care, and prevalence of untreated decay was 87.4 percent. **Conclusion:** Dental needs are high among migrant children. Mobile clinics provide a safety net for them.

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What is already known on this subject? Underserved migrant children suffer from dental diseases. However, there is a little, if any. documentation of the size of this epidemic in this population. The authors found only one study from Michigan about the oral health in migrant children and the study reported a much smaller problem than the one reporting from California.

What does this study add? This paper is the first to describe the oral health status in relation to access to dental care among migrant children. Delivering dental care to this population is challenging, and, in this paper, the authors describe a successful model of providing oral health care to this population through mobile clinics and in partnership with the community to identify the most underserved population of migrant children.

It has been shown that poor oral health occurs in areas that lack access to services.[1] Access to oral care can be limited by geography, cost, personal lifestyle decisions, lack of education, fear, and/or anxiety.[2] Healthy People 2010 highlights these disparities in oral health status, with one of its objectives being to address these disparities and improve utilization among underserved children.[3]

Rural, low-income, and minority communities in California suffer from a geographic maldistribution of dentists.[4] Overall, 91 percent of California's dentists practice in urban areas where only 84 percent of the population resides.[5] By federal shortage designation standards, 12 percent of the state's population is estimated to be in dental shortage areas. Rural areas tend to have the fewest dentists, but minority and low-income communities within urban areas are also disproportionately underserved.[5]

CDA JOURNAL, VOL 38, Nº2

TABLE 1

Demographic and Dental Access Profiles for the Study Locations[12, 13, *]

Location	Population	Race (%)					Median household income	# of dentists & dentist/ patient ratio
		White	Black	Native Indians	Asian	Other		
Bakersfield	283,010	62	9	1	4	24	$39,982	285 (1:993)
Glendale	200,908	64	1	0	16	19	$41,805	216 (1:930)
Taft	9,054	83	2	1	1	13	$33,861	6 (1:1,509)
Wasco	23,179	35	10	1	1	53	$28,997	15 (1:1,545)
Woodlake	7,073	47	0	1	1	51	$23,653	2 (1:3,537)

* Yellow pages and phone calls to dental offices.

California is a major agricultural producer in the United States. With more than 85,000 farms, there are more than 1,000,000 people employed in work involving agricultural practices.[6] Most of the people in this workforce are immigrants; some are seasonal workers who migrate according to employment opportunities, while others have managed to settle into rural communities where they have regular, often seasonal, employment.[6] These migrant workers' families and their children in California are among the most underserved, with dental disease ranking as one of their top five health problems.[7] The poor level of oral health of farm workers corresponds with lack of access to preventive care.[8]

Mobile dental clinic services have the potential to more efficiently and economically provide oral health care to underserved populations who have difficulty accessing care.[9] A model of one such mobile dental clinic is that operated by the University of Southern California School of Dentistry, USCSD, which brings high quality comprehensive dental care to rural and inner city children with minimal access to such care. In its more 40 years of continuous operation, the USCSD Mobile Dental Clinic has provided comprehensive dental care to underserved children in 70 communities, frequently returning to these same communities annually.[10]

These mobile programs have been successfully incorporated into the dental curriculum as community service-learning educational experiences for both dental and hygiene students.[11] Such programs can make the services available, accessible, and affordable to underserved populations. At the same time, these clinics provide an opportunity for the dental and hygiene students to experience and learn the many social factors related to poor oral health, including providing practical training in cultural competency.

This study illustrates the oral health status of six different underserved populations of children in California who are mainly the children of migrant workers. It assesses their barriers to oral health care and how treatment delivered using a mobile dental clinic improved their oral health status.

Methods

The study was conducted at six California locations: Two different locations in Bakersfield (referred to as Bakersfield 1 and Bakersfield 2 throughout the text), Glendale, Taft, Wasco, and Woodlake, visited by the USCSD Mobile Dental Clinic in the period between March and September 2004. Wasco, Taft, and Bakersfield are in Kern County; Woodlake is in Tulare County; and Glendale is in Los Angeles County. TABLE 1 displays the population and economic indicators of the towns of Wasco, Taft, and Woodlake, and the cities of Bakersfield and Glendale, including their racial profile, median household income and dentist/patient ratio.[12]

In 2000, Glendale had the highest median household income ($41,805) while Woodlake had the lowest ($23,653). These communities were far below the median household income in California of $56,645.[13] Wasco had the highest percentage of blacks (10 percent) while Glendale had the highest percentage of Asians (16 percent). The dentist/patient ratios in Woodlake (1:3,537) and Wasco (1:1,545) were the least favorable (TABLE 1).

Approximately one year in advance, the USCSD Mobile Dental Clinic schedules and organizes the administration of each site with local nonprofit community groups (e.g., Office of Migrant Education, Kiowa-Kaweah Delta Health District, Glendale Healthy Kids, etc.). Various sites use differing strategies to recruit the 100 to 120 children with the greatest oral health needs and fewest resources. Some of the community organizations have engaged the school nurses in this endeavor in attempt to ensure that children in pain and with obvious decay are included. The parents of the identified children are then given informed consents and medical history forms by the community partners in preparation for the mobile dental clinic visit.

The USCSD Mobile Dental Clinic fleet consists of five vehicles, including one equipped exclusively for sterilization and storage of supplies. All vehicles arrive at the site (usually located at elementary schools) a few days in advance of the

clinic treatment period for a detailed set-up process. On the first day of the clinic, faculty, senior dental students, and residents from USCSD perform complete exams with radiographs and medical history reviews and then obtain parental permission to begin the treatment indicated.

Throughout the next week, senior dental students, supervised by faculty, complete the scheduled treatment including comprehensive restorative, periodontal, surgical, and preventive care. All examinations and treatment received by patients in these clinics were based on USCSD comprehensive standards of care. All the treatment plans are verified by faculty members. Any follow-up care or specialty referrals needed were provided by local dentists who volunteer to help with the USCSD Mobile Dental Clinic patients.

As the USCSD Mobile Dental Clinic has been returning to the same communities for decades, the development of a local cadre of volunteer dentists willing to see underserved children ineligible for government support has been developed at each site.

This study utilized a cross-sectional design with child-parent pairs (families) referred to the USCSD Mobile Dental Clinic serving as a convenience population. These families were approached by the mobile dental clinic faculty, one of two dental students or staff trained on project methodology and asked to participate in the study. The study purpose and methodology were explained to all parents and children. Parents who chose to participate were asked to sign a consent form and to complete a questionnaire about their children's access to dental care. The study has satisfied the requirement of the USC Institutional Review Board.

Except for Glendale and Woodlake, all of the patients were referred to the USCSD Mobile Dental Clinic through the Migrant Education Program. Frequently, the parents of the Woodlake children were also migrant workers; however, the referral mechanism was not through the Office of Migrant Education. To qualify for the Migrant Education Program the child had to have changed school districts or states at least once in the past three years. Many families moved more than this because of their seasonal employment usually involving agriculture or food processing.

To give perspective to the numbers involved, the Bakersfield Migrant Education district (No. 21), where the USCSD Mobile Dental Clinic worked in 2004, had 9,632 children in school, more than 85 percent of them qualified for the free lunch program, 26 percent for the English learner program, and Spanish was the most common other language. In Glendale in the 2004-05 school year, 41.3 percent qualified for the free or reduced lunch program and 27.5 percent for the English learner program, with Armenian being the most common other language (13.5 percent).[14]

VARIOUS SITES
use differing strategies to recruit the 100 to 120 children with the greatest oral health needs and fewest resources.

The survey used in this study was the questionnaire prepared by the Association for State and Territorial Dental Directors to assess children's access to dental care.[15] The questionnaire asked about experience of pain and reasons for not receiving dental care in the past 12 months, time since last dental visit, medical, and dental insurance. Questions were adapted from different surveys such as National Health Interview Survey 1997.[16] Some of these questions have been used in recent national surveys such as National Health and Nutrition Survey 2004.[17] The questionnaire was administered in either English or Spanish according to the preference of the parents. Information about the child's oral health needs and treatment delivered during the visits to the USCSD Mobile Dental Clinic were obtained from the dental charts. All dental records including dental diagnosis, treatment plan, and details of procedures provided were checked and verified by one of the authors (Faust) who was one of the faculty in charge of the clinic. A dental assistant was trained by one of the authors (Seirawan) to review the patients' dental charts and extract the clinical data. The collected data was entered into a database, designed especially for this project. Ten percent of the electronic data was randomly selected and checked by two authors (Seirawan and Faust) for accuracy. To avoid the parents' fears of discrimination, the USCSD Mobile Clinic does not ask about the ethnic and racial backgrounds of the children.

Descriptive statistics and frequency tables were generated. Distributions were examined using histograms, Kolmogorov-Smirnov normality tests, chi-square tests, and the Wilcoxon rank-sum test. Statistical analysis was performed using SAS System v9.1.[18]

Results

Two-hundred-fifteen child-parent pairs participated in this study out of 566 children who received treatment in the six USC Mobile Dental Clinics mentioned previously. The participating children averaged 10.5 (SD=3) years of age, with females comprising 48.4 percent of the sample. The overall response rate was 38

TABLE 2

Children's Past Oral Pain Experience, Access to Care, and Care Utilization by Clinic

	Bakersfield 1	Bakersfield 2	Glendale	Taft	Wasco	Woodlake	All clinics
Pain in the last 12 months	4 (33.3%)	12 (38.7%)	28 (41.2%)	8 (38.1%)	15 (62.5%)	19 (51.4%)	86 (44.6%)
Visited dentist in the last 12 months	4 (40%)	9 (25.7%)	19 (25.3%)	11 (50%)	3 (13.6%)	9 (25.7%)	55 (27.6%)
Needed inaccessible dental care in the last year	6 (60%)	13 (59.1%)	26 (40%)	6 (66.7%)	10 (76.9%)	20 (62.5%)	81 (53.6%)
Needed care but could not afford in the last year	4 (66.7%)	10 (76.9%)	4 (15.4%)	5 (83.3%)	7 (70%)	17 (85%)	47 (58%)
No medical insurance	10 (90.9%)	31 (91.2%)	72 (94.7%)	12 (85.7%)	21 (94.5%)	29 (87.9%)	175 (92.1%)
No dental insurance	11 (100%)	34 (100%)	75 (98.7%)	12 (92.3%)	22 (100%)	29 (87.9%)	183 (96.8%)
Never been to dentist	0 (0%)	7 (20%)	15 (20%)	2 (9.1%)	12 (54.6%)	14 (40%)	50 (25.1%)
n	*12*	*37*	*77*	*24*	*28*	*37*	*215*

TABLE 3

Percentages of Children With Different Categories of Untreated Decayed Teeth by Clinic

	Bakersfield 1	Bakersfield 2	Glendale	Taft	Wasco	Woodlake	All clinics
0 teeth	2 (16.7%)	9 (24.3%)	11 (14.3%)	5 (20.8%)	0 (0%)	0 (0%)	27 (12.6%)
1-4	3 (25%)	17 (45.95%)	26 (33.8%)	11 (45.8%)	5 (17.9%)	4 (10.8%)	66 (30.7%)
5-8	5 (41.7%)	10 (27%)	31 (40.3%)	6 (25%)	14 (50.0%)	18(48.7%)	84 (39.1%)
9+	2 (16.7%)	1 (2.7%)	9 (11.7%)	2 (8.3%)	9 (32.14%)	15 (40.5%)	38 (17.7%)
n	*12*	*37*	*77*	*24*	*28*	*37*	*215*

percent. The response rate was the highest in Glendale (73 percent) and the lowest in the Bakersfield 1 (12.5 percent). The majority of children were from migrant workers' families who were referred by the migrant education programs. Most of the parents (67.9 percent) elected to receive all materials in Spanish and 40 percent of the children who were cared for in Glendale were Armenian, as profiled by the authors' local community partner.

TABLE 2 summarizes the children's past oral pain experience, access to care and utilization prior to their visit to the USCSD Mobile Dental Clinic at each location. Based on information reported in the questionnaire about the 12 months prior to the children's visit to the USCSD Mobile Dental Clinic: 54 percent of the children had needed dental care, 45 percent of children had experienced oral pain, yet only 28 percent of children had visited a dentist during that time. Dental pain was most prevalent in Wasco where about two thirds (62.5 percent) of the children had experienced oral pain in the past 12 months, but only 14 percent of them had visited a dentist during the same period. Most children did not have medical (92.1 percent) or dental insurance (96.8 percent) (TABLE 2). About 20 percent of children had not been to a dentist during the past three years and an additional 25 percent had never been to a dentist in their lives.

However, the results in terms of pain, inaccessible needed dental care, and insurance were not significantly different between those who have been to a dentist and those who have never been. Also, interestingly, the prevalence of decay was 85.9 percent among those with no fillings (data not displayed).

The prevalence of untreated tooth decay was very high among these groups of children totaling 87.4 percent of the respondents (188 out of 215). Specifically it reached 100 percent in Wasco (28 out of 28) and Woodlake (37 out of 37). Seventy percent (150 out of 215) of all children had between one and eight untreated decayed teeth, 17.7 percent (38 out of 215) of children had nine or more untreated decayed teeth (TABLE 3). The children averaged 5.3 (SD=3.8) untreated decayed teeth and 1.2 (SD=2.6) filled teeth (TABLE 4).

Whether decayed or filled, the numbers of teeth in each category were nearly equally divided between the deciduous and permanent teeth. Among the group of children who had never been to a dentist (n=50) the prevalence of decay was 92 percent and the average number of untreated decayed teeth was

TABLE 4

Children's Prevalence of Decay, and Averages of Decayed and Filled Teeth and Surfaces Prior to Treatment in a Mobile Clinic

	All children	Children had never been to dentist	Children had been to a dentist
	n=215	n=50	n=149
Prevalence of decay	87.4%	92%	85.9%
		Mean (SD)	
UNTREATED DECAYED TEETH			
Permanent (DT)	2.8 (3)	3.2 (3.5)	2.6 (2.7)
Deciduous (dt)**	2.6 (3.1)	3.8 (3.6)	2.1 (2.6)
Both (DT & dt) ***	5.3 (3.8)	6.9 (3.8)	4.7 (3.5)
FILLED TEETH			
Permanent (FT) **	0.7 (2.1)	-	0.9 (2.3)
Deciduous (ft) **	0.6 (1.6)	-	0.7 (1.8)
Both (FT & ft) ***	1.2 (2.6)	-	1.6 (2.8)
UNTREATED DECAYED SURFACE			
Permanent (DS)	4.7 (5)	5.2 (5.1)	4.5 (4.7)
Deciduous (ds) *	5.7 (7.4)	7.2 (7.3)	5.2 (7.5)
Both (DS & ds) **	10.4 (8.1)	12.4 (6.9)	9.8 (8.5)
FILLED SURFACES			
Permanent (FS) **	1.1 (3.4)	-	1.3 (3.8)
Deciduous (fs) **	1.1 (3.7)	-	1.5 (4.2)
Both (FS & fs) ***	2.2 (4.9)	-	2.7 (5.4)

For differences between the group who had been and who had not to a dentist:
* 01<p<0.05
** 0.001<p<0.01
*** <p<.001

TABLE 5

Total Services Provided for Children During Study Period (N=215)

Type of treatment	Number of procedures
Prophylaxis and fluoride	215
Sealants	626
Fillings (composite or amalgam)	908
Extractions of primary teeth	246
Extractions of secondary teeth	8
Pulp therapy	69
Stainless-steel crowns	30

6.9 (SD=3.8), which differed significantly from the group who had been to a dentist who averaged 4.7 (SD=3.5) (p<0.001). Likewise, the average number of decayed surfaces for the "never been to dentist" group (mean=12.4, SD=6.9) was significantly greater than the "seen dentist" group (mean=9.8, SD=8.5) (P=0.01).

TABLE 5 shows the type and number of clinical services provided to children who participated in the study. None of the participants' parents refused the proposed treatment plan. The oral health status of all children improved after the intervention by the USCSD Mobile Dental Clinic. Completed treatment for all children included prophylaxis, topical fluoride, and oral hygiene instructions as part of their comprehensive care. By the end of treatment, each child received an average of 2.9 (SD=2.8) sealants and 4.2 (SD=3.7) fillings.

Extractions of predominantly primary teeth averaged 1.2 (SD=1.7) teeth per child. Twenty-eight (13.4 percent) of the patients were referred to local volunteer dentists or specialists for follow-up care, including endodontic, periodontic, oral surgery, and orthodontic treatment. Families were encouraged to visit the local volunteer dentists for follow-up care particularly for space maintenance needs.

Discussion

This study illustrated the poor oral health status and lack of access to care among groups of underserved children in California and how they benefited from services provided by the USCSD Mobile Dental Clinic. In the authors' study, the percentage of children who had never been to a dentist (25 percent) was five times greater than other children in California (5 percent) based on the recent assessment of kindergarten and third graders in California.[19]

The data showed that the dental health of our children was substantially worse than other studied children in California. For example, the prevalence of untreated decayed teeth, both permanent and primary in the authors' study sample (87.4 percent) was very much higher than other statistics of children in California (29 percent).[20] The mean number of untreated decayed teeth (5.3) in these children is substantially higher than that of other children in the third grade (2.03) in the state of California based on the report of California Oral Health Needs Assessment of Children.[20]

Access to dental insurance has been shown to be directly related to care utilization.[21] The authors found almost 97 percent of the children studied did not have dental insurance compared to 76.3 percent of children aged 2-11 years statewide.[22] As previously indicated, the majority of these children were from migrant workers families and limited available studies on these populations indicate generally poor oral health status.[6] The authors' study shows 25 percent of children had not previously been to a dentist, which is similar to results (26.6 percent) found in a study on oral health of farm workers.[6] The percentage (87.4 percent) of children with decay in the authors' study was higher than that (65 percent) found for migrant children in a study conducted in Michigan.[6] This could be due to the fact that the authors used both clinical and radiographic examinations, which may have led to more diagnosis of decay.

The data shows that children in Wasco and Woodlake had much worse dental health and obviously greater dental needs. It is noteworthy that the ratios of dentists per population were more unfavorable in these two communities than in all other areas studied. The authors' results clearly indicated that mobile dental clinics can reach underserved populations in areas where there are inadequate numbers of oral health care providers. The Surgeon General's Report on oral health identified similar barriers to care including inability to access places where care is delivered and lack of means to pay for the care once there.[2] The psychosocial determinants of dental health attitude and behaviors also affect access to and compliance with oral health care.[23]

Healthy People 2010 includes oral health objectives for children aged 6-8, which involve reducing the proportion of children with untreated tooth decay in primary and permanent teeth to 21 percent and reducing the proportion of children over the age of 2 who do not see a dentist at least once a year to 17 percent.[3] The authors study sample showed that 92 percent of the children who had never been to a dentist had acquired tooth decay; and those living in areas with the most unfavorable dentist/population ratios had the highest levels of dental caries (100 percent) and pain (62.5 percent). These findings offered further proof that availability and access to care do affect oral health.

MOBILE DENTAL CLINICS can reach underserved populations in areas where there are inadequate numbers of oral health care providers.

Few of these communities attract fee-for-service private practices as a result of the low economic profile of the community including lower median household income and dental insurance enrollment. Yet, the high level of dental disease necessitates the provision of a safety net for dental services. Mobile dental services operated by dental schools and philanthropic organizations can help meet this need. These models have clearly proven that they have the potential to make dental services available, affordable and accessible to those in underserved areas. Dental schools, through their service learning community outreach programs can provide both urgently needed oral health services to underserved populations and exceptional educational experiences to dental students.[10]

The USCSD Mobile Dental Clinic has been continuously in operation since 1964, securing its operational funding through grants and community sponsors. It will continue to fulfill its mission of promoting and improving oral health among underserved children in Southern California as an integral part of its educational and service mandate.

Study Limitations

One of the authors' concerns in initiating the study had to do with the length of the survey instrument. They wanted the shortest validated instrument available as they were well aware of the time limitations, language, and literacy problems of the parents of the children. Therefore, the authors chose the ASTTD survey, which consisted of seven questions. As a result, the desired detail was not acquired. It is important to remember, however, that children selected for care in the USCSD Mobile Dental Clinic visit are those who had the greatest need and had no alternative source of care. Therefore, they probably represent the most underserved of all children with limited access to dental care.

Additionally, the number of people willing to participate in the survey were low. It is the authors' belief that these low

numbers may have been due to the fact that many of the parents were undocumented workers who were reluctant to give out any "extra" information that might "get them into trouble," even though their confidentiality was assured.

Other difficulties were the language barriers and lack of literacy. In future efforts, the authors plan on using more community promotoras to better explain the study concept, purpose, safeguards, and benefits. From the experience gained with this study, however, the authors believe that information can be gathered from parents of children utilizing the USCSD Mobile Dental Clinic by interviewing focus groups of parents exploring themes and topics in more depth than can be done with a written questionnaire. This will be the future direction of the authors' research efforts.

As a result of this study, the authors recommend the expansion of the services of mobile dental clinics into more underserved areas. The involvement of more dental and dental hygiene students in the mobile dental clinics could provide more preventive oral health services including: oral hygiene instruction, nutritional analysis and advice, oral health behavior modifications, application of sealants, and fluoride varnish. Also, the recruitment of more volunteer local dentists to provide for the continuing dental care and follow-up referrals would be an additional goal through strong advocacy for the needs of the large number of children who are not eligible for government-funded dental health insurance.

Conclusion

The authors' study assessed the poor dental health status and access to care among groups of the most underprivileged and underserved children in California. The USCSD Mobile Dental Clinics has served as a safety net to improve the oral health of these children. Further research is needed to understand the oral

health knowledge, attitudes, and behaviors of underserved migrant families and their barriers to oral health care, and to develop and evaluate new strategies to deliver dental care to these families. ■■■■

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Antimicrobial Effect of *Rosa Damascena* Extract on Selected Endodontic Pathogens

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ABSTRACT The purpose of this study was to compare the antimicrobial activity of a plant-derived extract (2 percent *Rosa damascena* extract) with 5.25 percent sodium hypochlorite (NaOCl) and 2 percent chlorhexidine (CHX) on selected endodontic pathogens. The minimum inhibitory concentrations (MICs) of 2 percent rose extract and 2 percent CHX for test microorganisms, except *F. nucleatum*, were lower than that of 5.25 percent NaOCl. All solutions were able to kill all test microorganisms after one minute.

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The main purpose of root canal treatment is to eliminate microorganisms and their by-products from the root canal system. Residual pulpal tissue and microorganisms may persist in the irregularities of infected root canal system, even after meticulous instrumentation. Therefore, various irrigating solutions have been recommended to maximize the root canal disinfection.[1,2]

Although many of currently available irrigating solutions have variable strengths, all have some weak points as well. The ideal irrigant must be an antimicrobial agent that does not cause toxic effects on periapical tissues while in contact with them.[3]

Use of plant-derived preparations has increased over the last few decades. Various plant-derived extracts and essential oils have traditionally been used to treat a variety of diseases. *Rosa damascena Mill*, belonging to the *rosaceae* family, is one of the most important *Rosa* species. *Rosa damascena* today is highly cultivated all over the world. In addition to its perfuming effect, *Rosa damascena* is used for medicinal properties and this aspect is steadily increasing in the world. It has been shown that essential oils and extracts from the flowers of *Rosa damascena* have analgesic, anti-inflammatory, antioxidant, antimicrobial, and anti-HIV properties.[4-8]

The purpose of this study was to evaluate edible 2 percent rose extract for potential use in root canal therapy by comparing its antimicrobial activity with 5.25 percent NaOCl and 2 percent CHX, commonly used antimicrobial endodontic irrigants, against *Enterococcus faecalis, Actinomyces naeslundii, Porphyromonas gingivalis, Fusobacterium nucleatum,* and *Candida albicans*.

TABLE 1

Minimum Inhibitory Concentrations (%) of 2% Rose Extract, 2% CHX, and 5.25% NaOCl on Test Microorganisms

Test microorganism	2% rose extract	2% CHX	5.25% NaOCl
E. faecalis	0.06	0.06	0.08
A. naeslundii	0.03	0.03	0.04
P. gingivalis	0.03	0.06	0.08
F. nucleatum	0.06	0.06	0.04
C. albicans	0.015	0.03	0.04

Materials and Methods

Test solutions used in this study were the following: 5.25 percent NaOCl (Vista Dental Products, Racine, Wis.), 2 percent chlorhexidine gluconate liquid (Consepsis, Ultradent, Salt Lake City), and ethanolic extract of *Rosa damascena* (2 percent rose extract, Barij essence, Kashan, Iran).

Test Microorganisms

The following microbial strains were evaluated:

Facultative anaerobes: *E. faecalis* (ATCC 29212) and *C. albicans* (ATCC 10231)

Obligate anaerobes: *A. naeslundii* (ATCC 49340), *F. nucleatum* (ATCC 25586), and *P. gingivalis* (ATCC 33277)

Analysis of Antimicrobial Activity

The minimum inhibitory concentrations (MICs) against the test microorganisms were determined using broth macrodilution method. All tests were performed in screw-capped tubes containing 1 ml of serial twofold dilutions of test solutions in brain-heart infusion (BHI) broth (Mast, Merseyside, United Kingdom) for facultative anaerobes or thioglycollate medium w/o dextrose or indicator (Difco, Detroit) for obligate anaerobes.

Microbial strains were twice cultured overnight at 35 degrees Celsius in BHI agar or supplemented brucella blood agar. Then 1 ml of each microbial suspension (106 CFU/ml) was used as inoculums. After incubation of obligate anaerobic microorganisms in anaerobic jars for 48 hours and facultative organisms for 24 hours at 35 degrees Celsius, the first tube without turbidity was determined as the MIC.

Another part of this study concerning the evaluation of the antimicrobial activity of test solutions at different time periods was performed according to the previously described method.[9] Briefly, microbial samples were kept in contact with each test solution at different time intervals: one minute, five, 10, 20, and 30 minutes. Afterward, 0.1 ml of samples were taken from the broth and spotted on BHI agar. After 24 hours of incubation, plates were examined for microbial growth. All assays were repeated five times. The positive controls were considered tubes containing broth, microbial suspension, and sterile saline solution. Each test solution was also included in the experiment without microbial strains as negative controls.

Results

The results of MIC analysis have been shown in TABLE 1.

The order of MICs for each microorganism was as follows:

2 percent rose extract=2 percent CHX <5.25 percent NaOCl for *E. faecalis*

2 percent rose extract=2 percent CHX <5.25 percent NaOCl for *A. naeslundii*

2 percent rose extract < 2 percent CHX <5.25 percent NaOCl for *P. gingivalis*

5.25 percent NaOCl < 2 percent rose extract=CHX for *F. nucleatum*

2 percent rose extract < 2 percent CHX <5.25 percent NaOCl for *C. albicans*

The results of antimicrobial activity evaluation after different periods of time showed that 5.25 percent NaOCl, 2 percent CHX, and 2 percent rose extract were able to kill all test microorganisms after a contact period of one minute. The same results were obtained after periods of five, 10, 20, and 30 minutes of contact (TABLE 2). There was no difference among the antimicrobial activity of test solutions at mentioned periods of time. All positive controls showed normal microbial growth while negative controls showed no microbial growth.

Discussion

The microorganisms used in this study were relevant because they are part of the endodontic microbiological flora. Both obligate and facultative anaerobes were used in this study. Primary root canal infections are polymicrobial, typically dominated by obligate anaerobic bacteria.[10] However, certain groups of microorganisms such as enterococcus, actinomyces, and candida seem to be associated with cases of failed root canal treatment.[11-13]

In the current study, antimicrobial activity of 2 percent rose extract was compared to 5.25 percent NaOCl and 2 percent CHX those of which being well-documented in endodontics.[14]

The results of MIC assay in this study showed that the MICs of 2 percent rose extract and 2 percent CHX for *E. faecalis, A. naeslundii, P. gingivalis,* and *C. albicans* were lower than that of 5.25 percent NaOCl. In other words, these microorganisms were inhibited with lower concentrations of 2 percent rose extract and 2 percent CHX when compared with 5.25 percent NaOCl. On the other hand, the MIC of 5.25 percent NaOCl for *F. nucleatum* was lower than those of two other test solutions.

In this study, comparison of the antimicrobial activity of 5.25 percent NaOCl, 2 percent CHX, and 2 percent rose extract at different time periods showed that all test solutions were effective in killing all

TABLE 2

Antimicrobial Effect of Test Solutions at Different Time Periods

Test solution	Time periods	*E. faecalis*	*A. naeslundii*	*P. gingivalis*	*F. nucleatum*	*C. albicans*
2% rose extract	1 min	–	–	–	–	–
	5 min	–	–	–	–	–
	10 min	–	–	–	–	–
	20 min	–	–	–	–	–
	30 min	–	–	–	–	–
2% CHX	1 min	–	–	–	–	–
	5 min	–	–	–	–	–
	10 min	–	–	–	–	–
	20 min	–	–	–	–	–
	30 min	–	–	–	–	–
5.25% NaOCl	1 min	–	–	–	–	–
	5 min	–	–	–	–	–
	10 min	–	–	–	–	–
	20 min	–	–	–	–	–
	30 min	–	–	–	–	–
Sterile saline (positive control)	1 min	+	+	+	+	+
	5 min	+	+	+	+	+
	10 min	+	+	+	+	+
	20 min	+	+	+	+	+
	30 min	+	+	+	+	+

+ indicates presence of growth
- indicates absence of growth

test microorganisms after a contact period of one minute. This result is in agreement with some authors indicating elimination of *E. faecalis* and *P. gingivalis* by 5.25 percent NaOCl and 2 percent CHX within one minute.[15] Furthermore, Sassone et al. found that 5 percent NaOCl eliminated *E. faecalis, P. gingivalis,* and *F. nucleatum* immediately.[16] Radcliffe et al. contrasted this result partly, as 5.25 percent NaOCl required two minutes to kill *E. faecalis*, whereas this irrigant killed *C. albicans* and *A. naeslundii* within 10 seconds.[17] It should be noted that the results of these studies are influenced by experimental methods.[18]

In the current study the antibacterial activity of 2 percent rose extract against selected endodontic pathogens was the same as that of 5.25 percent NaOCl and 2 percent CHX. All test solutions had strong antimicrobial activity on facultative anaerobes, obligate anaerobes, gram-positive (*E. faecalis, A. naeslundii,* and *C. albicans*) and gram-negative (*P. gingivalis* and *F. nucleatum*) strains even after short periods of time. Some authors contrasted this result partly. Yi et al. and Aridoğan et al. found that rose extract had antimicrobial activity on *C. albicans* and gram-positive bacteria such as *E. faecalis* but not on gram-negative bacteria.[6,7]

The chemical analysis has revealed that essential oils and extracts from the flowers of rose contain some alcohols such as citronellol, nerol, geraniol, and eugenol.[19] The antimicrobial effect of rose extract in this study may be related to alcohols and/or eugenol components.

Many chemical root canal irrigants are cytotoxic and may cause severe pain reaction if they gain access into the periapical tissues.[20] Analgesic and anti-inflammatory properties of essential oils and extracts from the flowers of *Rosa damascena* might be considered as advantages of an endodontic irrigant.[4,5] Moreover, rose extract smells pleasant in contrast with some chemical antimicrobial irrigating solutions.

In conclusion, rose extract has a good potential for using in root canal therapy. However, the findings of this study were limited to the antimicrobial activity and did not evaluate other properties of this plant-derived preparation as an irrigating solution. ■■■■

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***BURBANK** - Turn-Key Practice 3 eq ops., 1,050 sq. ft. office, two story medical/dental building. ID #1171.
***ENCINO GP** - 3 eq. ops., 1,200 sq. ft. suite, 7 story professional building. Projection approx. $580,582 for 2009. ID#2631.
***GLENDALE** - Turn-Key Practice 3 eq ops., 5 plumbed not eq., 2,000 sq. ft. suite, two story Med/Dent Bldg. ID #2591. **Price Reduction!!**
***HUNTINGTON PARK** - 4 eq. ops., 1,700 sq. ft. office, free standing building. Projecting approx. $210,734 for 2009. ID#2681. **SOLD**
***LANCASTER GP** - 3 eq. ops., 1,200 sq. ft. suite, one story shopping center. BUYER'S NET OF $123,769. ID#2691.
***LOS ANGELES GP** - 4 eq. ops., 1,700 sq. ft. office, strip shopping center. Projecting approx. $354,424 for 2009. ID #2621.
LOS ANGELES GP (NEW) - Turn Key - 3 eq. ops., multi story med/dent bldg. Proj. approx. $196, 133 in 2009. Great views. ID #2831.
MARINA DEL REY (NEW) - Great starter location - LSHLD - 2 eq. ops., 1 plmbd, Only dental practice in bldg. ID #2791.
***REDONDO BEACHGP** - 3 eq. ops., in large remodeled shooping center. Proj. approx. $273K in 2009. NET $82,122. ID #2821.
TEMPLE CITY GP - 4 eq ops., 1,170 sq. ft. office, one story free standing bldg. Projecting approx. $375,602 for 2009. ID #2551.
TORRANCE - Leasehold Improvements & Equip. Only! 2 eq. ops., 1 plmbd not eq., 900 sq. ft. suite. ID#2731. Good start location.
***SAN PEDRO (NEW)** - 2 eq. ops., 1 plmbd., 1,400 sq. ft. office located on 2nd fl of strip center; visible location. Subject to selling office w/Willimington Office. BUYER' NET $196,505. ID #2851.
***WILLMINGTON GP (NEW)** - Largest Longshoreman Provider - 3 eq. ops., 1,400 sq. ft. office. BUYER'S NET OF $314,943. ID#2841.
***WEST HILLS GP** - 6 eq. ops., 2,300 sq. ft. suite, 3 story Med. Prof. Bldg. Projecting approx. $1,185,531 for 2009. ID#2721.

ORANGE COUNTY

***BUENA PARK** - Newly Remodeled Practice - 5 eq. ops., 2,000 sq. ft. office, strip mall. Collected approx. $364,379 in 2008. ID #2271.
IRVINE GP/SPEC - Leasehold Improvements & Equip. Only! 3 ops., 1 plmbd not eq., suite in 2 story Med/Dent Bldg. ID #2661.
GARDEN GROVE GP (NEW) - 7 eq. ops, 2,200 sq. ft. ste. 16+yrs of Goodwill. Collected $1,061,802 in 2009. NET $354K. ID#2891.
***TUSTIN GP (NEW)** - Turn Key - State of the Art office - 5 eq. ops., 3 chairs in open bay. Ready for multi specialty office. ID #2861.
WESTMINSTER GP - 2 eq. ops., 850 sq. ft. suite, single story strip mall. BUYER'S NET OF $52,233. ID#2711.

RIVERSIDE / SAN BERNARDINO COUNTIES

CORONA GP- Leasehold Improvements & Equipment Only! 3 eq. ops., 1 plmbd not eq., 1,600 sq. ft. ste. ID# 2541.
***INDIAN WELLS GP** - Long established practice, 5 eq. ops., 1,400 sq. ft. suite, 2 stroy prof. bldg. NET $151,585. ID #2801.
PERRIS - 4 eq. ops., 1,608 sq. ft. office located in shopping center. Coll. approx. $265,041 for 2008. ID #1891. **Price Reduction!!!**

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***PASO ROBLES** - 7 eq ops., 1,800 sq. ft. office, one story free standing bldg. BUYER'S NET OF $326,183. ID #2231. **SOLD**

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- **EL SOBRANTE:** *For Sale*-General Dentistry Practice: Ideal for recent grad or DDS looking for satellite practice. 3 ops. w/potential of 5. '08 receipts $350K, adj. net income $124K. 3 days of hygiene. Pano, Easy Dental software. 1,300 sq. ft. Seller is retiring after 35years in same location. #14302 SALE PENDING
- **FRESNO AREA:** *For Sale*-**Exceptional** General Dentistry Practice. This outstanding practice has annualized collections of $1,921,467, $798K adj. net income. The office has Dentrix, Laser, Intra-oral camera, digital x-ray and Pano. Bldg. may be avail. for sale. Owner is retiring. #14283
- **FRESNO:** *For Sale*-General Dentistry IV Sedation Practice. Collections $1,064,500. Seller looking for either an outright sale or a buyer to purchase 1/2 of the practice. Buyer will need IV sedation skills or have been trained to provide IV sedation. Facility 1,500 sq. ft. w/5 equipped operatories & 7 days of hygiene. #14250
- **FRESNO:** *For Sale*-General Dentistry Practice. Owner has practiced in same location 24 years. 3 ops rooms, 1,000 sq ft. Located in a Medical/Dental Bldg. Owner to retire. 2008 collections were $86K. Ideal for a new grad or satellite office. SALE PENDING
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- **MODESTO:** *For Sale* - General Dentistry Practice. 5 operatories, 32-years in practice. Gross Receipts $884K w/adjusted net income of $346. Dentrix, Cerec, and Intra-oral camera. Owner to retire.
- **MODESTO:** *For Sale*- General Dentistry Practice. Collections $1,097,000 adjusted net income of $350,543-No Medi-Cal. Office space is 3,580 sq ft, Laser, Intra & Extra-oral camera, and Pano. Office is open 5 days a week, 3 hygeine days. 2 or 3 dentist could work together comfortably in this facility. 10 years in same location. #14289
- **NO. CA WINE COUNTRY:** **ENDO PRACTICE** For Sale-GR 958K adj net $673K 4 Ops, 1,500 sq ft. Overhead 29% Owner to retire #14296
- **PALM SPRINGS:** *For Immediate Sale* - General Dentistry Practice. 2008 Gross Receipts $906K with adj. net income of $346K. Highly desire able location with 4 ops. Laser, and Intra-oral camera. 5 days of hygiene. Owner recently deceased. SOLD
- **PINE GROVE:** *For Sale*- Owner Dentist recently deceased. Collections for corp. year ending Sept. 20, 2009 were $222, 580. Nice 3 Op fully equipped for $111,300. Great semi-retirement opportunity or 2nd office. Located 1 mile off of HWY 88 above Jackson. Temp Dentist in place.
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- **RANCHO SANTA MARGARITA:** *For Sale* - Dental office space & equipment. 1200 sq. ft. ops. with dental leaseholds and fully equipped dental equipment. Built by Henry Schein in 2005 Pelton and Crane cabinetry and steralization center. This is a winderful opp. to have a nice office at a very low cost by taking over lease. A great opp. for a start up or sat. practice. #14301
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- **REDDING:** *For Sale*-Owner looking for Assoc. trans. into Partnership w/Buy-Out. GR $1 Million dollars income $436K. 5.5 days hygiene, 2,200 sq. ft. #14293
- **RENO: FOR IMMEDIATE SALE DECEASED DENTIST** - General Dentistry Practice. 2 ops, 17yrs. present location '07 GR $263K with adj. net of $263K w/65% overhead. Bldg. also for sale. Owner deceased. SALE PENDING
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- **YUBA CITY/ MARYSVILLE:** *For Sale*-General Dentistry Practice w/Bldg avail. Practice located in present (great) location over 30 years.1,800 sq ft 3 ops 4 hygiene days. Owner to retire.#14273 SALE PENDING

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BEVERLY HILLS - Patient Charts
Patient Charts of a long established GP. Seller is relocating.

SAN JOAQUIN COUNTY (Pedo)
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Long established pediatric dental practice with a fantastic presence in a busy and popular location. The large "child friendly" office includes 11 equipped ops with 2 quiet rooms and 1 hygiene room. The seller is retiring.

LOS ANGELES (Endo)
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FRESNO – (3) op G.P. (4) yr old eqt. Mixed patients. 2009 Projected Collect ~ $250K pt. **NEW**
FRESNO SUBURB – (3) op G.P. Gross Collect. $375K/yr. No competition. **REDUCED!**
GLENDALE – Extremely motivated Seller wishes to sell their (4) op (2 eqt'd/2 plumbed) G.P. located in a free stand. bldg. Gross Collect. ~ $120K/yr p.t. Excellent starter or buy & combine.
HIGHLAND – (3) op G.P. located in a shop ctr. Annual Gross Collect $250K+. **SOLD**
LA MESA #3 – (5) op G.P. 4 eqt'd. Mixed pts. $5K/mos Cap. '09 Proj Gross Collect. ~ $475K.
LODI – (4) op/(3) eqt'd G.P. Cash/Ins/PPO/HMO. Cap Ck ~ $6K/mos. '09 Proj Gross $460K.
LOS ANGELES (KOREA TOWN) – 7 op computerized State of the Art G.P. with an Annual Gross Collection of $1.4M+ and an Annual Net Income of ~ $450K. Cash/Ins/PPO only. Cerec 3, digital x-rays, Dentrix s/w, ICAT Imaging System, (2) lasers, PRP System. **PENDING**
NORTH HOLLYWOOD – (4) op/(2) eqt'd Turnkey Dental Office w pts. Located in a grocery store anchored Shop Ctr. Excell exposure/visibility. Heavy foot traffic/walk ins. **PENDING**
PETALUMA – (2) op G.P. Cash/Ins/PPO/HMO. Cap Ck ~ $3K/mos. '09 Proj Gross $480K.
RESEDA – (4) op G.P. Cash/Ins/PPO/small amt Denti-Cal. Gross Collect $230K+/yr p.t.
SAN JACINTO (HEMET AREA) – (4) op Computerized G.P. Absentee owned HMO pract. w $6K/mos Cap Checks. No Denti-Cal. 2009 Project. Gross Collect. $450K on a (3) day wk. **NEW**
SANTA CLARITA VALLEY – (11) op comput. G.P. (10) ops eqt'd 11th op plmb. Cap Cks. $14K-$16K/mos. Cash/Ins/PPO/HMO/min Denti-Cal. Annual Gross ~ $1.6M. **Back on Market**
STOCKTON – **WOW! ~ $18K/mos CAP Checks!** (7) op comp G.P. Cash/Ins/PPO/HMO pts. No Denti-Cal! Cap Ck ~ $18K/mos. '09 Projected Gross Collections ~ $1.25M. Absentee Owner.
TARZANA – (3) op G.P. in shop ctr. '08 Gross $551K+ on a 2-3 day wk. Mixed pts. **SOLD**
UPLAND – (3) op comput. G.P. in a strip ctr. Open 1½ yrs. Like new eqt. Digital. **SOLD**
VENTURA Multi-Specialty – 5 op comput paperless office, digital x-rays/Pano. Newer Eqt. 2 days/wk Pedo, 3 days/mos O.S., 2 days/wk Endo, 1 day/mos Perio. Gross $540K+ **REDUCED!**
WESTLAKE VILLAGE – TURNKEY OFFICE no patients. (4) op drop dead gorgeous office. Marble floors, travertine ctrs etc. (3) ops of newer eqt. 4th plumbed. Digital x-rays.
WOODLAND HILLS – (3) op comput. G..P. Dentrix s/w. Located in a strip ctr. Cash/Ins/PPO only. 2009 Proj. Gross Collect $700K. New eqt., digital x-rays/intra oral camera. **PENDING**

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CLASSIFIEDS, CONTINUED FROM 130

S.F. PRIME FINANCIAL DISTRICT OFFICE — Ground level suite with 5 ops, computer and digital radiography equipped. Large sterilization area, small lab, private lunchroom and bathroom. Available to share with a dentist with current patient base or looking to start a practice. Great opportunity for buy-in or purchase in the next three years. Flexible and open for discussion. Contact: Dr. Paul Hoyt at 415-399-9999 or 415-516-9670, email: paulhoyt@aol.com.

OPPORTUNITIES AVAILABLE

OPPORTUNITY AVAILABLE — Dental Assisting Program Director wanted to develop curriculum/teach at new center in Tarzana, California. Experience required. Call Laura 818-758-3557.

OPPORTUNITY AVAILABLE — NORTHWESTERN WASHINGTON — Seeking experienced dentist for busy, established, rapidly growing, fee-for-service group dental practice. Excellent immediate income opportunity ($180,000 to $375,000 + per year) depending on productive ability and hours worked. Secure long-term position. You can concentrate on optimum patient treatment without practice management duties. Newly equipped, modern office with excellent staff and lab services provided. If you are bright, energetic with a desire to be productive, very personable, people oriented and have great general and specialty clinical skills, fax resume to Otto J. Hanssen at 425-484-2110.

CONTINUES ON 138

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3013 SAN BENITO COUNTY GP

Now Available, quality well-est. practice with state-of-the-art equip. in attractive 2,246 sq. ft. fac. with 6 ops. Seller will be relocating - out of area. Approx. 2,500 active pts. 2008 GR $870K+. Asking $563K.

3008 SOUTH ALAMEDA COUNTY GP

Quality oriented practice with a reputation for comprehensive thorough care by well-trained SOLD ed staff. Located in 2,100 sq. ft. state-of-the-art facility with 6 ops. 2008 GR $1M+, ~1,980 active pts. and 19 new pts./mo. Seller Asking $580K.

2999 NO. CA COAST

Flourishing Pediatric Dental Practice. Well est. with se... SOLD aff. 4,000+ active pts., avg. 50-... mo. Avg. over 2.2M in Gross Receipts. Fully equip. 1,600 sq. ft. office with open bay and 2 quiet areas Asking $1,542,000.

3006 MONTEREY COUNTY ORTHO

Est. Ortho practice in 2,668 sq. ft. office with 5 open bay chairs in a professional dental complex. Panorex and Cephlometric X-ray machines. Stable and loyal referral base. GR for 2008 were $340K+. Annualized GR as of Oct 2009 are $335K +. Owner retiring and willing to help for a smooth transition. Asking 227K.

3015 NORTH BAY GP

Beautiful North Bay location, close to the Wine Country! Est GP offering 36 years of goodwill in a modern, fully-networked, 1,500 sq. ft. office. 4 fully-equip. ops with room for more. Approx. 1,300+ active pts. (all fee-for-service) with 10-15 new pts./mo. 2008 GR $886K on 4 Dr./week. Adj. net of over $300K. Asking $630K. Building also available to purchase. This is a wonderful opportunity.

2986 SAN JOSE FACILITY & EQUIP

A 1 1/2 year-old stunning facility with small pt. base that has all the bells and whistles. 2,000 sq. ft., state-of-the-art dream office. Located in desirable comm./residential neighborhood close to O'Connor Hospital & Valley Fair Mall. 6 ops and new equip. For the est. GP who is looking to move into a larger facility or for the assoc. GP who is ready to start out on their own. Asking $475K.

3011 MID-PENINSULA GP

Located in a single story retail shopping centre. 2,000 sq. ft. office with 7 fully-equip. ops. Seller leaving area. 2008 GR 1.1M+ Asking $716K.

3012 PENINSULA GP

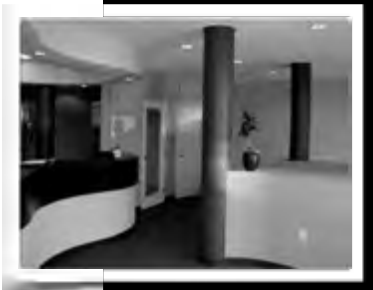
Seller retiring fr... his long established general ...,400 sq. ft. fac. with 3 fully e... SOLD ...ops. Located in desirable neighborhood close to down town area. 2008 GR $322K+ with a 4 day doctor work week. Asking $194K.

3017 SOUTH BAY

Est. Cosmetic and Restorative Practice in desirable area. Seller retiring and able to help for a smooth transition. 1,530 sq. ft. office with 4 fully equipped ops. 2008 GR $891K+. Please contact us for details.

3016 CONTRA COSTA COUNTY PERIO

Est. 1990 in desirable bedroom community 20 miles from SF. 1,068 sq. ft. beautifully remodeled office w/4 fully-equipped ops., & excellent staff. Assignable 5 year lease w/5 year option. Seller willing to help in the transition of the practice. 2008 GR $441K+, 2009 GR projected to $460K + as of Oct. Terrific upside potential. Asking $275K.



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WESTERN PRACTICE SALES

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BAY AREA

A-6781 SAN FRANCISCO - Established in 1993. New equipment-hardly used. VIRTUALLY NEW practice! 1,000 sf/3 ops. **$65k**

A-7751 SAN FRANCISCO- ***Space Sharing.*** GP seeks DDS to share office in renowned 450 Sutter St bldg. ***Call for details!***

A-817 BELMONT- Surrounded by dental specialties in a 2-story Prof. Bldg w/easy access to public transportation. 860sf w/ 2 ops & plumbed for 1 add'l. **$210k**

A-829 SAN FRANCISCO Facility– Attractive Office w/traditional décor. 1600sf & 2 fully equipped ops. Priced at only **$49k**

B-7881 TRI VALLEY, CA - ***Facility Only*** - Location, Location, Location! 1070 sf, 4ops, ADEC chairs and equipment. Fully networked Dentrix computers. **$400k**

NEW! **B-846 OAKLAND**- Long-established, fee-for-service practice.Excellent reputation. Dental Prof Bldg. 2,100sf w/ 3 fully equipped ops **$325k**

C-690 SANTA ROSA -1050 sf with 3 ops. One of the most prestigious areas in Santa Rosa. Very mature landscape & beautiful office. Emphasis on Crown & Bridge, esthetics dentistry & prosthetics **$345k**

C-787 SANTA ROSA - GP in very desirable area. 1700 sf , 4 fully equipped ops. Gross over $300k last year! Write your own success story here. **$150k**

C-7811 SOLANO CO - 2,997 sf w/6 fully equipped ops + 2 Hyg ops + 1 add'l op! Buy the whole practice for $1.3m or only 50% for $650k. **Call for Full Details!**

C-809 VACAVILLE- Relaxed workweek! Stable patient base. Well-maintained, single-story Dental Prof. Bldg on major steet. Desirable Area. 1,500 sf / 4ops **$150k**

D-779 SUNNYVALE - Well established GP in heart of Silicon Valley! 4 ops, 1050sf. Call for more information! **$225k**

BAY AREA CONTINUED

C-820 VALLEJO- Strong, loyal patient base growing by word-of-mouth referrals. Located in popular & busy Shopping Plaza w/ excellent signage, visibility, freeway access & heavy foot traffic. 1,500 sf & 4 ops **$395k**

D-790 MORGAN HILL FACILITY - **SPECTACULAR!** Dental Prof Plaza on busy intersection. 1,730 sf/5ops, 3 of which are fully equipped. ***This is an Ideal Satellite Office for Specialty Practice!*** **$75k**

D-824 SANTA CLARA- GP - 35+ new pats/mo by word-of-mouth referrals. Retail Shp Ctr in heart of Silicon Valley. Just 6 years old w/ 1,500 sf & 3 fully equipped ops. Plumbed for 1 add'l op **$485k**

D-8301 SAN JOSE- FFS - "One Stop Shop" w/multiple Specialists under one roof. Exc Pt Base. Amazing opportunity in a highly desirable, family-oriented community. 2,400 sf & 8 fully equipped ops, **$1.2m**

NEW! **D-842 PLEASANTON** –General Dentistry. 1,488sf w/ 2 ops **$295k**

NEW! **D-845 SAN JOSE** - ***Facility*** - Attractive office w/ traditional décor. Retail Plaza in desirable area. 2,240 sf & 5 ops. ***Call for details!***

NORTHERN CALIFORNIA

E-680 FOLSOM - Seller leaving behind all equipment & improvements! 2143 sf, 2 ops & plumbed for 4 add'l. Seller Will Consider ANY Reasonable Offer! **ONLY $150k**

E-748 SACRAMENTO -Convenient location. 820sf/2ops. Plumbed for 1 add'l. **$65k**

E-729 AUBURN - Busy retail shp ctr w/ excellent signage & good traffic flow. Well maintained FFS practice. 1750sf, 4ops. Plumbed for 2 add'l ops **$300k**

NO. CALIFORNIA CONTINUED

E-7121 SACRAMENTO AREA – Largely FFS. 1800sf, 4ops (+2 add'l plumbed). Highly visible,2-story Prof bldg. **$775k**

E-818 SACRAMENTO-Increase the part-time, relaxed workweek and watch the practice grow! Loyal Patient Base. Collections over $350k in 2007. 1,200sf & 4 ops. ***Building previously appraised @ $260k in 2004. $315k for Practice AND Building***

E-821 *Facility* SACRAMENTO-Attractive office—traditional décor. Well-maintained, highly visible, single-story bldg. Great area. 1,400sf, 3ops. Plumbed 4th op **$60k**

NEW! **E-849 SACRAMENTO**-Established community in distinct area. FFS Quality practice. Free-standing building. 3 fully equipped ops **$205k**

F-7651 COASTAL EUREKA AREA-Near Thriving University. Vibrant student/staff population. Seller retiring. 2700sf, 6 ops. **$480k**

G-751 RED BLUFF/CHICO- Known for special sense of community & small town living. Complete remodel ~5 yrs ago. FFS GP. 2350sf / 4 ops equipped. Plumbed for 2 add'l. **Current Lender Willing to Carry Qualified Buyer. Practice Offered at $175k / Real Estate $250k**

G-761 CHICO-Seller retiring! 1000+ sf w/3 ops. Attractive Med Prof Bldg. Vibrant community **$150k**

H-634 WEST OF RENO—On the Feather River in Plumas Co. 1500 sf/ 4 ops, excellent location. Lease below market value. **$250k**

H-668 NORTHEASTERN CA– GP with over 30 yrs goodwill. 4 ops 1600sf office. 2007 gr rcpts exceed $650k **$395k**

H-831 SUTTER CREEK -**"Buy-in" opportunity during Seller's eventual retirement plans.** Dental Prof Bldg w/ ample parking on a busy scenic highway in desirable neighborhood. 4 ops. **$160k**

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CENTRAL VALLEY

I-685 TURLOCK - 1700sf, 7 ops. Avgs 14 patients & 11 Hyg Pats/day! Practice recently remodeled. Highly attractive free standing building. Mostly Adec Eqpmt. **$350k**

I-772 *Facility* STOCKTON-Desirable, affluent health care area. 2,140sf/4 ops **$250k**

I-802 MODESTO - Facility. ~ 1500sf w/4 ops & room for 1 more. State of the art facility directly in front of Vintage Faire Mall **$445k**

I-823 MODESTO-Digital Ready Network . State of the Art GP. Superb Locale in busy desirable area. 2550 sf & 6 ops. **$400k**

I-838 MODESTO- Retail Shopping Center adjacent to a popular Supermarket, drawing walk-in patients from traffic flow & word-of-mouth referrals. 1,200 sf & 4 fully equipped ops **REDUCED! NOW ONLY $350k**

***NEW!* I-840 TRACY-** Must See to Appreciate! Major thoroughfare / desirable area. 2,165 sf & 6 ops. Plumbed for 1 add'l op. $**445k**

J-801 FRESNO– Facility. ~ 1300sf and 4 ops. Traditional Décor. **ONLY $70k**

J-828 FRESNO - Attractive Corner Prof bldg w/ excellent visibility. 2,120 sf & 5 fully equipped ops **$585k**

SOUTHERN CALIFORNIA

K-735 ALISO VIEJO FACILITY - Upscale 2 story Prof Bldg. 1,800sf/4 ops. $4k sublet income at this location as well! **$225k**

K-762 INDIAN WELLS– Well Respected practice w/loyal patient base. Newly remodeled, 1400+ sf, 5 ops **REDUCED! NOW ONLY $475k**

K-793 SAN DIEGO-2500sf & 4 fully equipped ops w/ plumbing for an add'l 2 ops. Highly Desirable Neighborhood **$475k**

SOUTHERN CALIFORNIA CONT

K-805S SANTA MARIA - State-of-the-art, fully computerized, paperless office w/ digital x-rays. 1,450sf **$100k**

K-827 STUDIO CITY-Highly esteemed, 4 op fee-for-service practice setting the bar for excellence! Near Beverly Hills, W. Hlywood ,Westwood **$515k**

K-805G GROVER BEACH- Draws tourists w/moderate coastal climate, drive-on beach, dune hiking, fishing, clamming, golfing, horseback riding, & wine tasting. Remodeled - 1,250sf w/4 ops **$120k**

K-816 MISSION VIEJO-Reputation as one of the best dentists in this vibrant OC Comm. Top-notch office in popular Rtl Shp Ctr. Close proximity to Gov. amenities & schools. 1,300 sf & 2 ops. **$325k**

***NEW!* K-847 SANTA MARIA-** Spacious ops and picturesque windows capturing scenic views. . 1,200+ sf/3 ops + 1 add'l **$425k**

NEVADA

LV-756 LAS VEGAS-Brand new 1,600sf/ 3 op office (Plumbed for 1 addl op) Attractive & well-equipped in Rtl Shpng Ctr. **$150k**

LV-796 HENDERSON - Master-planned community! Excellent location & easy freeway accessibility. Spacious, like-new office. 2,080 sf w/3 fully equipped ops & plumbed for 3 add'l ops **$295k**

LV-791 LAS VEGAS - Low Cancellations and High Collections! 12-20 pats/day. 1900sf with 4 fully equipped ops + plumbed for 1 add'l. **PRICE REDUCED!! $275k**

LV-565 LAS VEGAS - Nice Prof bldg. Multiple Lease spaces and size options in growing Rainbow/Sahara Area. Great Area w/ lots of potential. **NOW ONLY $325k**

LV-694 LAS VEGAS - Well established, large GP. 2200 sf & 6 ops. Gross Receipts over $900k. Equipment less than 5 years old. Office was recently painted and carpeted. **$545k**

NEVADA CONTINUED

R-810 DAYTON-Gross Rcpts over $1mil in 08! Amazing, quality, well-estab w/loyal, stable patient base & seasoned staff. Excellent signage, easy freeway accessibility, ample parking. 1,500sf & 5 ops. **$595k**

LV-800 LAS VEGAS-Well Established FFS practice. Emphasis on prevention. Seasoned Staff. 3350 sf & 6 ops. **$785k**

R-841 RENO –Long-established, quality practice committed to patient education, technology & self improvement. Wonderful, stable patient base. Excellent signage, Centrally located in desirable, upscale neighborhood. 1,750 sf & 5 ops. **$350k**

NEW!* LV-850 LAS VEGAS-** Med Prof complex. 2,603 sf & 6 fully equipped ops, ***$652,200

SPECIALTY PRACTICES

K-653 GARDEN GROVE—ORTHO - Desirable area. 2200 sf 4 chairs in open bay. 2 private ops. **$285k**

C-6821 SOLANO CO. PROSTHO- Personalized treatment in warm caring environment. 1040 sf with 3 fully equipped ops. **$390k**

I-7861 CTRL VLY ORTHO- 2,000sf, open bay w/8 chairs. Garden View. Antique Exam Room. 45 years of goodwill. FFS practice sees 60-70 patients daily. Prof Plaza. **$370k**

B-7851 EAST BAY ORTHO - LOCATION is Superb! 35-40 pats per day. Prof Dental Plaza. 1380 sf / 6 chairs **$450k**

C-7841 W CO.CO. COUNTY—ORTHO - Well established—35-40 patients per day. Busy Plaza Setting near local Middle and High Schools. ~ 1350 sf & 6 chairs in open bay. Just off I-80 corridor. **$400k**

E-811 SIERRA FOOTHILLS ORTHO- Fast growing area. Patient Oriented, Well respected Ortho practice. Avg 30 pats/day. 1200 sf & 3 chairs in open bay. **$175k**

***NEW!* I-8481 TWO PERIO practices CENTRAL VALLEY - Office[1]**: 1,100sf & 2 ops. **Office[2]:** 1,660sf & 2 ops **$130k**

Timothy G. Giroux, DDS

Jon B. Noble, MBA

Mona Chang, DDS

John M. Cahill, MBA

Edmond P. Cahill, JD

CLASSIFIEDS, CONTINUED FROM 134

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GP IN SAN DIEGO FOR SALE — Walking distance from ocean. Seller retiring. Provide your personal info and experience to myhappydays0105@yahoo.com.

PRACTICE FOR SALE — 40 year old established general practice in Fresno. Good location in professional building. Four equipped ops, panorex and intra-oral camera. 1,426 sq. ft. Priced right! Send inquiries to: California Dental Association, Attn: CDA Box 0809, 1201 K St., Sacramento, CA 95814.

PRACTICE FOR SALE — Land, building and dental practice for sale in Woodburn, Oregon. Call 503-720-1714.

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ADVERTISER INDEX

DR. BOB, CONTINUED FROM 142

English Toffee

Although tastier than CornNuts and of slightly less density, its consumption during the holidays accounts for cuspal chaos and should be regifted whenever possible.

Ice Cubes

Anyone chewing on ice cubes without reducing them to shaved or cracked ice deserves the aftermath of dental problems that will ensue. Addicts should receive professional help other than dentistry.

There are countless other objects such as pencils, eyeglass bows, and fingernails that join with Jujubes, Tootsie Rolls, salt water taffy and a plethora of other hard and/or sticky foodstuffs. In fact, there are but four substances that should be the focus of anyone wishing to die with their boots on and their own natural teeth in. They are:

Tofu

It has been described by humorist Dave Barry as "a semi-foodlike substance secreted by soybeans as a defense mechanism. Tofu can be used as a high-protein meat substitute, as well as a denture adhesive or tile grout. In its natural state, tofu is tasteless and odorless, but if you form it into a turkey-shaped lump, season it well, add gravy and bake it for two hours in a shallow pan at 350 degrees, you can also use it for minor driveway repairs."

Tofu can be a basic part of your dental diet, readily available in supermarkets and auto parts stores where it is offered as "firm" and "not so much."

Custard

Like tofu, custard places no strain on any part of the oral cavity, but has the advantage of tasting like extract of vanilla and nutmeg. It comes in the form of pie where it must be scraped off the soggy crust before ingesting, tarts (limit four), or sucked up in a turkey baster and injected directly into the mouth.

Mashed Potatoes

A long-time favorite of edentulous citizens, requiring only minor gumming to swallow, it has now found general acceptance since the advent a few years ago of synthetic premashed potatoes. Based on some proprietary amalgam of cellulose, partially hydrogenated polyester and served with a free-range gravy of a brownish color, it poses no threat to the masticatory mechanism.

Jell-O

A standard in hospitals where it is prepared fresh daily in 50-gallon drums and served to semiconscious patients who believe it is the best part of the meal. Processed in two colors, orange and lime, it is made of gelatin, the origin of which is arguably improbable. The sugarless variety is especially dentally acceptable and at no loss to its consistency that is somewhere between a solid and a liquid. Because of its inability to maintain a constant shape, there is a learning curve involving forks and spoons, neither of which is satisfactory.

Nutritionists, working with researchers to provide a universally acceptable diet for dental longevity, have had little success with the heedless public, which continues to grow more obese with each passing decade. The final solution may be to combine in a blender the cusp-busting bad stuff with the florets of broccoli and other allegedly good stuff you would normally never touch and drink your way to health. If you still maintain that a knife and fork are an essential part of a meal, you're on your own. ■■■■

DR. BOB REMEMBERS CHARLIE

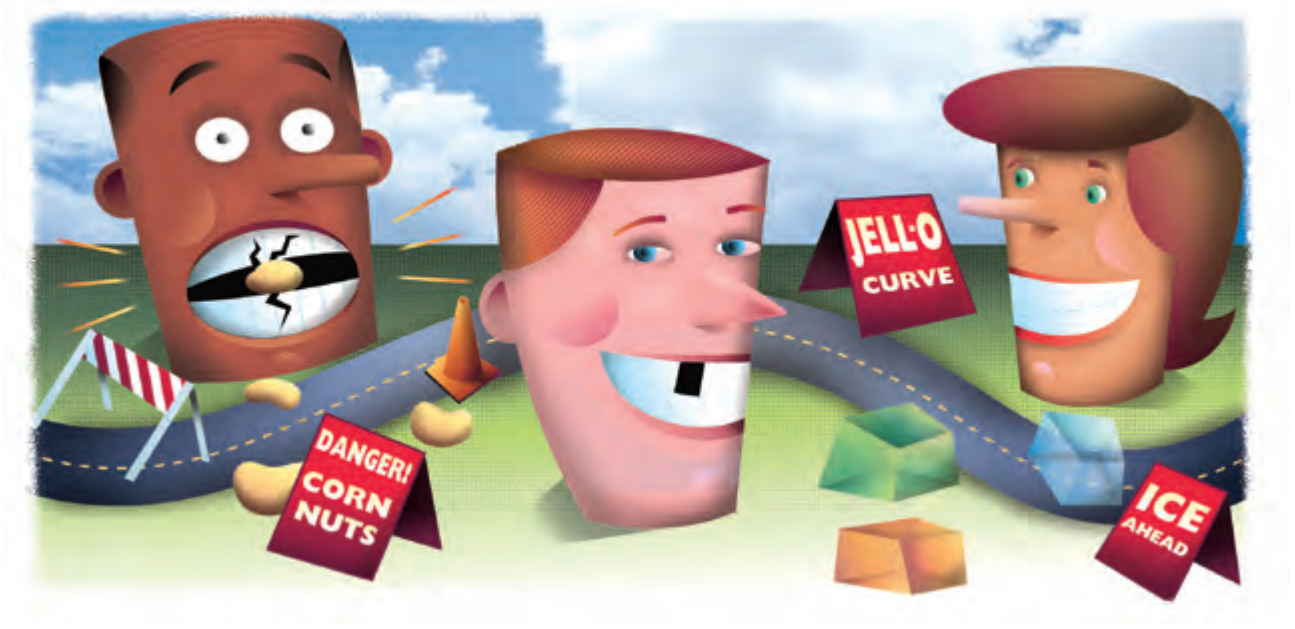
One of my dearest friends has died, a friend I had seen but twice in my life. I met Charlie Hayward at the ADA Convention in Orlando in 1992. Although he had been illustrating my articles for several years, this was our first face-to-face encounter, and it was as if we had been next-door neighbors since we were kids — instant chemistry. We had come together in Orlando to convince the members of the American Association of Dental Editors that having a humor column as a regular feature of a scientific journal was a good idea. I think they decided it wasn't, but we were Californians, so that probably excused us.

Charlie had ambitions to become an advertising agency art director, attending the Art Center College of Design in Los Angeles. He commanded an enormous talent that went off in multiple directions and included such diverse interests as sculpturing, hot rods, animating cartoons in Hollywood and referring to himself as "Emo Bimboom." Behind it all was a bizarre and wacky sense of humor that colored everything he did.

He once described our working arrangement as "like playing tennis. There's a kind of interplay between the illustrator and the writer. It's almost like he's betting if he adds something to the story, I will draw it." And draw it he did — more than 250 of his wonderful cartoons decorate the walls of my room. While the words in the articles are long forgotten, the 'toons and the man who created them will be forever fresh in my memory. Goodbye, Emo, if they have pencils where you're going, you'll be fine.

CDA JOURNAL, VOL 38, Nº2

Dental Diet



The diet/maintenance road is sadly in need of signs indicating potholes to avoid and limits to observe.

Robert E. Horseman, DDS

ILLUSTRATION BY DAN HUBIG

A few years ago, the profession of dentistry came to a fork in the road where a helpful sign indicated the left path offered a jet-propelled trip to instant visual gratification via a cosmetic freeway and the right road proposed a possible 50-year slog along a path with frequent stops for maintenance that required strict adherence to a compatible diet.

A sizable proportion of the public, whose priorities valued form over function, uttered broken little cries of expectation and veered off to the left. Others took the road less traveled even though the prospect of long-term diet to maintain their teeth into a nebulous future counted among the major soporifics of all times.

As an older dentist who thought he knew which side his bread was buttered on, I happily skewed to the cosmetic road to the best of my ability only to find that diet and maintenance were not separate entities, but inextricably bonded like conjoined twins. To belabor the metaphor a bit more, the diet/maintenance road is sadly in need of signs indicating potholes to avoid and limits to observe. To that end, are the following warnings offered as a public service to be stuck with little magnets on every refrigerator door:

Avoid By All Means

CornNuts

Invented in 1936 and originally intended as tavern snacks, CornNuts swiftly became the all-time practice builder for restorative dentists where they were known as "CuspBusters." The original corn kernels came from Peru, but a hybrid that would grow well in California was developed. Debuting in 1964 with an improved density equal to chrome-cobalt steel, they have been responsible for the loss of an estimated five million cusps to date, outdistancing cherry and prune pits and ice cubes.

CONTINUES ON 141

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