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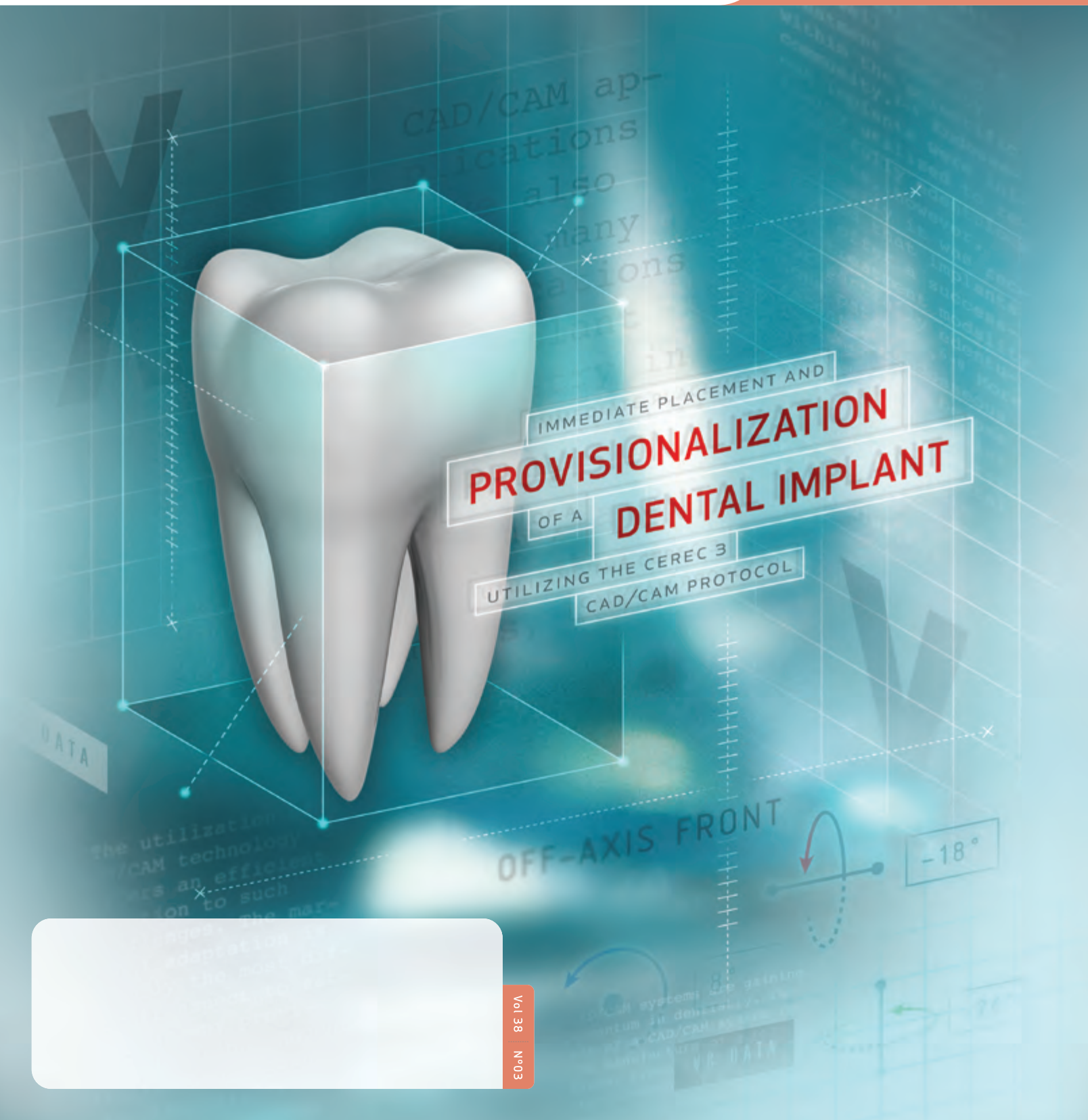
Journal

MARCH 2010



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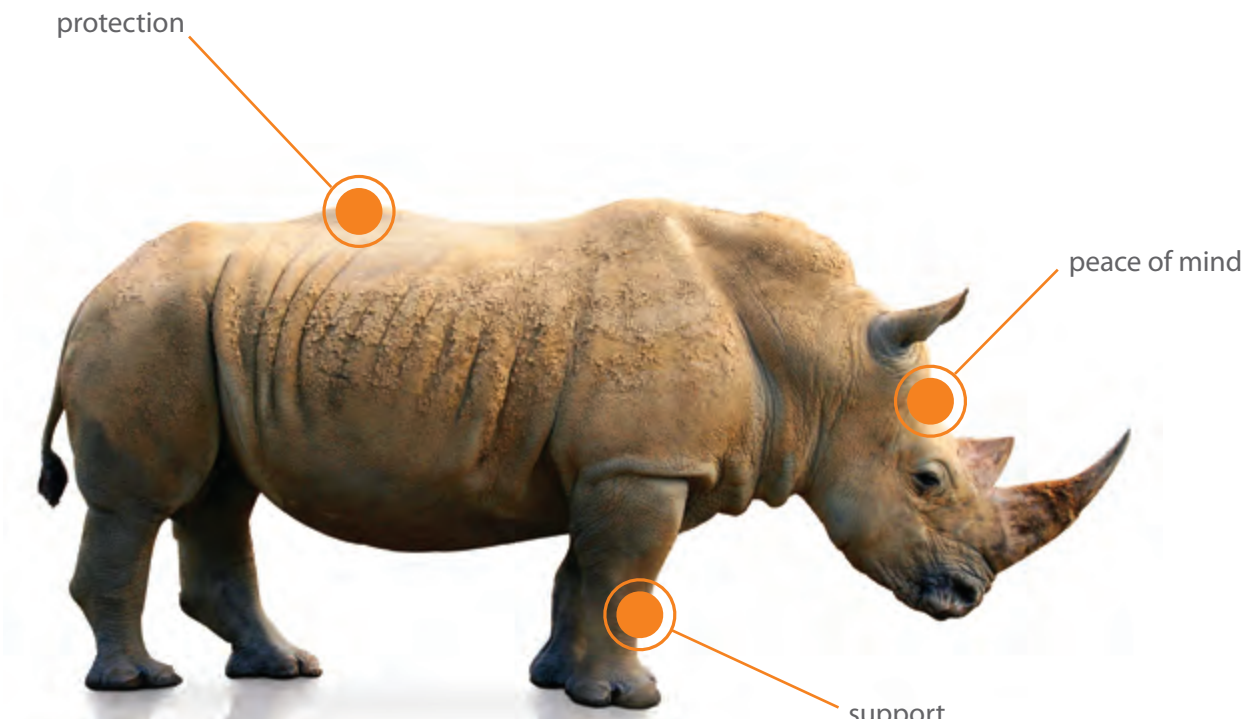

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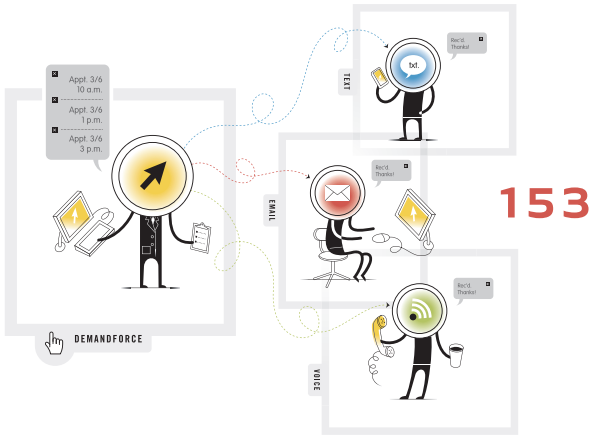

FEATURES

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CDA JOURNAL, VOL 38, Nº3

Pathways to Licensure

KERRY K. CARNEY, DDS

Greed is one of the great "lost" films. It was a silent film directed by Erich von Stroheim in 1926. The main character is Dr. McTeague, a dentist from 1890s San Francisco. Woven within the story line is the fact that Dr. McTeague is not a real dentist. He is a charlatan who learned his trade from another poser who moved from frontier camp to camp selling his dental services. There is an interesting scene in the restored footage that shows McTeague receiving a letter from the Dental Board. (Even then, a letter from the Dental Board was enough to strike fear into the heart of the recipient.) He had been found out, he had no license to practice. He was ruined.

For years, if one wanted to practice dentistry in California, there was only one pathway: the California Dental Board Examination. It was a trial by fire. It was a test of one's ability to remain sane in a very stressful and unnatural situation. It tested whether on that occasion, one could produce an appropriate patient and perform specified clinical procedures satisfactorily.

The state examination was seen as the only way to protect the public. Some saw it as a barrier to the influx of dentists trained in other states. Some saw it as a rite of passage, a hurdle of questionable relevance to the actual practice of dentistry but whose successful completion conferred membership in a fraternity of professionals. Some saw it as tit for tat. "If I had to do it, they have to do it." Time passes and things change.

There are currently three pathways to licensure in California: examination, credential, and postgraduate year (PGY-1). Those graduates of California Dental Board-approved dental schools or schools accredited by CODA (Commission on Dental Accreditation) may choose either the State Licensure Exam (the contemporary version of the California Dental Board Exam) or the Western Regional Board (WREB).[1]

There are currently three pathways to licensure in California: examination, credential, and postgraduate year (PGY-1).

Mobility and practice options are more enhanced by passing the WREB. The WREB is accepted by 31 states, including California, as fulfilling part of their licensing requirements. The trend has been increasingly in favor of the WREB. In 2004, 802 California dental school graduates took the California Dental Board exam. By 2009, that figure had dropped to 41.[2]

What about the graduates of dental schools not accredited by CODA or not approved by the Dental Board? Prior to 2004, these graduates had to pass the California Restorative Techniques Exam (aka the Bench Test) before they became eligible to take the licensure exam. Now, these graduates must complete a two-year international program before taking the state or WREB exam.

Five California schools now offer an international program. The class size varies from 32 at USC to 12 at UCLA. (UCSF and Loma Linda have classes of 24; Dugoni has a class of 22.)

The second pathway to licensure in California is by credential. It was implemented July 1, 2002. The requirements for license by credential are:

- A current dental license issued by another state. The license must be in good standing (not revoked, suspended, or otherwise restricted).
- Proof that the applicant has been in clinical practice, or has been a full-time faculty member, in the United States for a minimum of 5,000 hours in five of seven years prior to application. (A maximum of two of the five years of this requirement can come from a residency program approved by the Dental Board.)
- The applicant may not have failed the California licensure exam within the five years preceding application.
- Fifty units of continuing education credit within the two years preceding application, including mandatory C.E. required by the Dental Board.
- The Dental Board also considers disciplinary actions and information from the National Practitioners Data Bank and Drug Enforcement Administration.[1]

This pathway also includes a little twist. In lieu of the 5,000-hour requirement, the applicant may submit documentation of the following contracts:

- "The applicant agrees to practice dentistry full time for two years in at least one primary care or hospital clinic (e.g., community clinics located in defined dental manpower shortage areas) as defined by the board; or

CDA JOURNAL, VOL 38, Nº3

■ The applicant agrees to teach or practice dentistry full time in at least one dental education program approved by the board."[1]

As of October 2009, 1,676 licenses by credential have been issued. Another 19 licenses have been issued based on clinic contract and three have been issued based on faculty contract.[3]

The third pathway to licensure is by completion of a postgraduate year (PGY-1). It has been in effect in California since Jan. 1, 2007. There have been 135 licenses issued based on the residency pathway.[3]

These are the three pathways extant in California today. Other models are being discussed or already exist elsewhere in North America. The North East Regional Board (NERB) offers the Curriculum Integrated Format (CIF) or Segmented Licensing Exam. The CIF allows candidates to start simulated examinations in September of their senior year (instead of at the end of the senior year). Each exam must be passed before going on to the next. "This format provides the opportunity for remediation and the ability to retest a number of times prior to graduation."[1]

The Canadian model is based on a written exam and an Objective Structured Clinical Examination (OSCE). It has been used throughout Canada since 1994. The National Dental Examining Board conducts both exams. Successful completion allows the candidate to be "certified" as a general dentist. Certified candidates may apply to individual provinces for licensure. "The OSCE system does not use live patients. It is a timed, station examination that is held during one day."[1]

Each station has a number of questions and the candidate typically has five minutes to review the information (case history, photographs, radiographs, casts, models) and answer multiple-choice questions, or write a prescription. Other stations require the candidates to answer extended questions. "Each extended question may have up to 15 answer options and one or more correct answers."[1]

Other models are being discussed or already exist elsewhere in North America.

New pathways to licensure attempt to find solutions to problems that underlie the traditional pathway. During the last nine years, both ADA and CDA have passed resolutions in support of discontinuing the use of human subjects in licensure exams. The abandonment of the single state exams in favor of regional exams reflects the desire for mobility and reciprocity. Research on the development and application of haptic technologies could allow dental students to practice on virtual patients in the future. A portfolio pathway based on an accurate and reliable documentation of a dental student's clinical competence and skill could obviate the need for separate licensure testing for that graduate.

Licensure played a major role in the silent film, *Greed*. Poor McTeague's demise began with a letter from the California Dental Board and ended in the desolation of Death Valley. There he died of thirst along with his erstwhile best friend (whose girlfriend he had stolen, and, who, as an act of revenge, had reported McTeague to the board.) Artistic license enabled the production of von Stroheim's classic. A dental license enables us to practice the art and science of dentistry and preserves the public trust.

Many pathways and potential pathways lead to the practice of dentistry. They wind through a changing landscape of ethical concerns, political turf wars, technological advances, and the practicalities of implementation. Our ability to navigate the terrain successfully (and stay out of Death Valley) will determine the number and directness of the pathways to licensure in California. ■■■■

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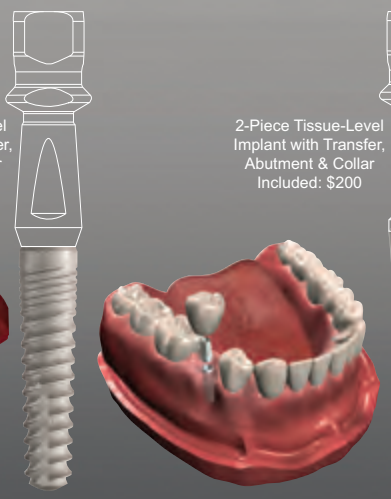

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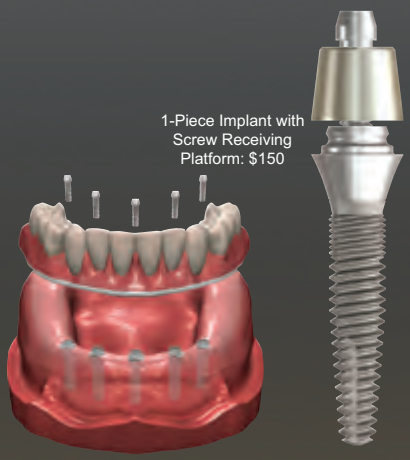

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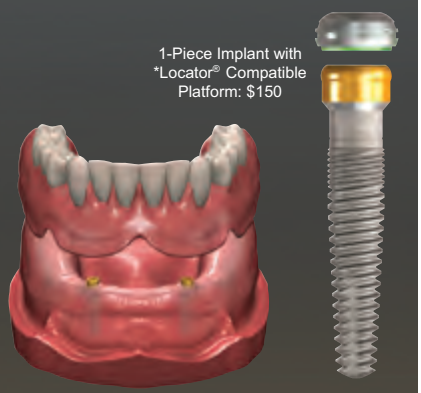

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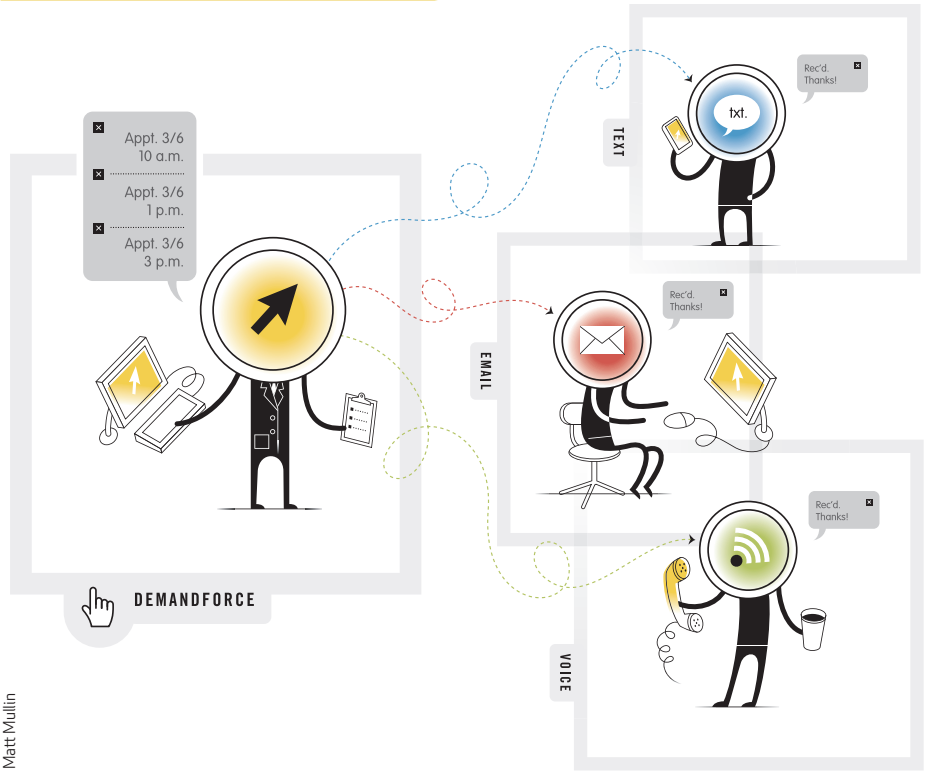


Matt Mullin

Significant Savings on Electronic Patient Communications

BY JESSICA JOISTEN

CDA Endorsed Programs has announced the selection of Demandforce, a provider of electronic communications, such as e-mails and text messages. Included in the new partnership is an exclusive $600 discount CDA Endorsed Programs negotiated for members.

Demandforce is an online patient communication system that integrates with existing practice management software to send communications, such as appointment reminders, to patients via text messages and e-mails. The system helps dentists attract new patients, retain

CONTINUES ON 155

FDI Provides Input on Materials for Dental Restoration

At a joint meeting last November of the United National Environmental Programme and the World Health Organization, experts discussed scientific evidence as it relates to restorative materials, such as dental amalgam, and the results of using amalgam alternatives in restorations.

Among the leaders and representatives were FDI President Roberto Vianna, DDS, MSD, PhD, and Dr. David Alexander, FDI executive director, who presented the organization's position for dentistry, based on the resolution on amalgam drafted and passed previously at the general assembly meeting during FDI's Annual World Dental Congress.

Vianna and Alexander contended in their presentation, "Dental Restorative Materials in Clinical Practice: Views of the Dental Profession," that no ban or phase-down of mercury used in the dental profession should occur before a true alternative to dental amalgam is widely available in all communities, according to a press release. FDI's position is based upon several of its own policy statements and was jointly crafted under the leadership of the Science Committee.

As a member of the UNEP Global Mercury Partnership, the FDI has been keeping a close watch on the global regulation of mercury. The Science Committee recommended forming a task team to ensure the international dental community and issues regarding dental amalgam were universally represented in UNEP discussions.

For more information about the UNEP Global Mercury Partnership and FDI's "Statement of Position" following the WHO-UNEP meeting in Geneva, Switzerland, go to fdiworldental.org.

CDA JOURNAL, VOL 38, Nº3

Surgical Masks 'Noninferior' as N95 in Preventing the Flu in Health Care Workers

A study of nurses at several Ontario, Canada, hospitals has revealed that surgical masks may be equally efficient as N95 respirators in protecting health care workers from influenza.

Four hundred forty-six nurses at eight hospitals in Ontario participated in a randomized, controlled trial led by Mark Loeb, MD, MSc, a professor at Canada's McMaster University in Hamilton.

In comparing the N95 respirators to surgical masks against the airborne virus, 221 were fitted with the N95 respirators while the remaining health care workers were given surgical masks. Both groups were instructed to wear their respective barriers while tending to patients with febrile respiratory illness.

From Sept. 23, 2008, to Dec. 8, 2008, "influenza infection occurred in 50 nurses (23.6 percent) in the surgical mask group and in 48 [nurses] (22.9 percent) in the N95 respirator group (absolute risk difference, 0.73 percent)," wrote the authors in a recent issue of the *Journal of the Medical Association*. What's more, even those nurses who had an increased level of the circulating pandemic 2009 H1N1 influenza strain, the study results demonstrated similarity in protection between the surgical mask group and the N95 respirator group for the 2009 influenza A (H1N1).

The Public Health Agency of Canada supported the study.

"Our findings apply to routine care in the health care setting," said the researchers in the article. "They should not be generalized to settings (in which) there is a high risk for aerosolization, such as intubation or bronchoscopy, where use of an N95 respirator would be prudent. In routine health care settings, particularly where the availability of N95 respirators are limited, surgical masks appear to be noninferior to N95 respirators for protecting health care workers against influenza."

Oral Health Will Be the Focus for Healthy People 2020

The American Dental Association is applauding the Department of Health and Human Services for calling attention to oral health in a national goal-setting effort for the year 2020.

"By retaining this emphasis on oral health, Healthy People 2020 will continue to inspire remedies to what former Surgeon General David Satcher referred to as the 'silent epidemic' of untreated oral disease in America," said ADA officials in a statement.

"Oral health has been a focus of Healthy People since its inception in 1990, and its inclusion has inspired dynamic and highly effective collaborations involving the private sector, the public health community, government, philanthropy, and our medical colleagues. We also applaud you for recognizing that oral health is inextricably linked to overall health and well-being and for reinforcing that principle throughout the entirety of Healthy People 2020," according to ADA's Dec. 31, 2009, letter to the HHS Secretary's advisory committee on health promotion and disease prevention objectives for 2020. "Your work fully acknowledges the role of oral health in access to health services, cancer, diabetes, educational and community-based programs, older adults, the public health infrastructure and tobacco use."

Healthy People is a 10-year campaign that singles out major preventable threats to the public's health and establishes national objectives to diminish them.

Risk for Diabetes Increased in People With Gum Disease

More than 90 percent of those with gum disease have a higher risk for diabetes, according to research conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. The goal of the study was to assess the nutritional and health status of children and adults in the United States.

Shiela Strauss, PhD, associate professor of Nursing and co-director of the Statistics and Data Management Core for New York University's Colleges of Dentistry and Nursing, pored over data from 2,923 adult participants in the 2003-2004 National Health and Nutrition Examination Survey who had not been diagnosed with diabetes. Utilizing guidelines created by the American Diabetes Association, Strauss found that 93 percent of those participants who had perio disease — compared to 63 percent who did not have perio disease — were thought to be at high risk for diabetes and should be screened for the condition.

According to the guidelines, screening is recommended for those who are at least 45 years old who have a body mass index of 25 or higher, and those who are under the age of 45 with a BMI of 25 but who also have at least one more diabetes risk factor.

In Strauss's study, two of those additional risk factors, that of high blood pressure and a first-degree relative (sibling or parent) with diabetes, were reported in a significantly greater number of subjects with periodontal disease than in subjects without the disease, according to a press release.

Strauss's findings, which were published in the online edition of the *Journal of Public Health Dentistry*, are part of an expanding body of proof that links perio infections to a higher chance in developing diabetes.

"In light of these findings, the dental visit could be a useful opportunity to conduct an initial diabetes screening, an important first step in identifying those patients who need follow-up testing to diagnose the disease," Strauss said.

The dental visit could be a useful opportunity to conduct an initial diabetes screening, an important first step in identifying those patients who need follow-up testing.

SHIELA STRAUSS, PHD

PATIENT COMMUNICATIONS, CONTINUED FROM 153

patients, reactivate lost patients, reduce no-shows, and measure patient satisfaction. Demandforce also is the only company in its field that guarantees results each month. It guarantees to generate $3 in value for every $1 spent each month or the next month is free.

"The Council on Endorsed Programs identified electronic patient communications as a service that would help members grow their practices," said Lyndon Low, DDS, chair, Council on Endorsed Programs. "We researched several companies for the endorsement and Demandforce stood out for its quality service and willingness to go above and beyond for members."

Jeffrey Barrera, DDS, of Arbours Aesthetic Dentistry in Rancho Santa Margarita, Calif., said, "My patients love the convenience of confirming an appointment through e-mail or text message. I love seeing a significant increase in my revenue."

Demandforce also helps dentists build their online reputations, which in large part is made up by certified patient reviews. Each night, the Demandforce system automatically sends a "Thank you" communication to patients who visited the practice earlier that day. The communication asks the patient to provide feedback in the form of a rating and review. Those reviews then are syndicated to a Demandforce reputational landing page, a Google local business listing, and an RSS feed, which can be easily embedded on any Web site. To see an example, type "Sacramento dentist" into Google. Click on "83 reviews" for the practice listed in spot "B."

"We are very excited by the new partnership with CDA and look forward to showing its members how Demandforce contributes patient retention, practice growth, and the building of a successful practice," said Rick Berry, Demandforce president.

The Demandforce system also offers a referral manager that makes it easy for existing patients to refer friends or family, integrated online scheduling, as well as a reporting suite that provides actionable data on the health of the practice. *Inc.* magazine recently named Demandforce as the fastest-growing software company serving the dental industry.

To learn more about Demandforce and the special offer just for CDA members, sign up for an educational Webinar at demandforce.com/cda.

Jessica Joisten is a senior marketing/media relations specialist with the California Dental Association.

Learning is not attained by chance, it must be sought for with ardor and attended to with diligence.

ABIGAIL ADAMS

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.
May27-29	Canadian Academy of Periodontology 55th annual general meeting, Vancouver, BC, cap-acp.ca.
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.

More Patients Identified in Excess Exposure to Radiation

An additional 50 patients have been identified by the U.S. Food and Drug Administration as being exposed to excess radiation during their CT perfusion scans. The exposure rate was estimated up to eight times the expected level and involve more than one CT scanner manufacturer.

Among the results of excessive exposure were reports of redness of the skin and hair loss following the patients' scans. An increased risk of certain types of cancer and cataracts can occur with radiation in high doses.

The FDA is providing interim recommendations for imaging facilities, radiologists, and radiologic technologists to help prevent additional cases of excess exposure. Included in the recommendations are that:

- Facilities assess whether patients who underwent CT perfusion scans received excess radiation,
- Facilities review their radiation dosing protocols for all CT perfusion studies to ensure that the correct dosing is planned for each study,
- Facilities implement quality control procedures to ensure that dosing protocols are followed every time and the planned amount of radiation is administered, and
- If more than one study is performed on a patient during one imaging session, practitioners should adjust the dose of radiation so it is appropriate for each study, according to a press release.

Go to: fda.gov/Safety/MedWatch/SafetyInformation/SafetyAlertsforHumanMedicalProducts/ucm186105.htm for more information.

Unsweetened Raisins Are the Better Choice for Your Cereal Bowl

While the benefits of wholesome raisins include a source of calcium and antioxidant properties, a recent study has determined that added sugar in raisin-containing cereals boosts the acidity of dental plaque.

While some dentists believe raisins and their gummy, sugary equivalents contribute to cavities because their properties make it difficult to quickly clear off the surfaces of the teeth, studies have revealed that is not the case, said Christine Wu, professor and director of cariology research at the University of Illinois at Chicago.

Wu also was the lead investigator of the recent study that involved bran flakes and raisins. The result was consuming bran flakes with raisins that had no added sugar did not increase the acid level in dental plaque than bran flakes without raisins.

Elementary-age children, ranging from 7 to 11 years old, compared four test foods: raisins, bran flakes, commercially marketed raisin-bran cereal, and a mix of bran flakes with raisins without added sugar, according to the study published in *Pediatric Dentistry*. Sucrose and sorbitol were used as controls.

The kids consumed each food group within two minutes and, at intervals, the acid produced by the plaque bacteria on their tooth surfaces was measured. With the exception of the sorbitol solution, all of the food groups promoted acid production in dental plaque within 30 minutes, with peak production between 10 and 15 minutes.

There is a "well-documented" danger zone of dental plaque acidity that puts a tooth's enamel at risk for mineral loss that may lead to cavities, Wu said. Achint Utreja, a research scientist and dentist formerly on Wu's team, said plaque acidity did not reach that point after the test subject consumed 10 grams of raisins, according to a press release.

Compared to eating bran flakes alone, adding unsweetened raisins to bran flakes did not increase plaque acid.

Genetic Study Reveals the Origins of Cavity-Causing Bacteria

The intricacies of a caries-causing bacteria has been decoded by a group of international scientists.

In uncovering the full genetic structure of *Bifidobacterium dentium Bd1*, researchers learned about the genetic adaptations that allow this microorganism to survive and bring about decay in the human oral cavity. The study, headed by Marco Ventura's Probiogenomics laboratory at the University of Parma, Italy, as well as Douwe van Sinderen, MSc, PhD, and Paul O'Toole, BA, PhD, of the Alimentary Pharmabiotic Centre at University College Cork, Ireland.

Better known as a long-term, beneficial bacteria found in the intestines, *Bifidobacterium* frequently are included as probiotics of food to boost the immune system and assist in digestion. But not all species within this genus are helpful. The species *Bifidobacterium dentium* is considered an opportunistic pathogen since it has been linked to the progression of tooth decay. Research of the genome sequence of *B. dentium Bd1* brought to light how the microorganism has adapted to the oral environment through specialized nutrient acquisition features, acid tolerance, defenses against antimicrobial substances and other gene products that increase fitness and competitiveness within the oral niche, according to the study published in the Dec. 24, 2009, issue of *PLoS Genetics*.

Data showed the evolvement with only a few number of horizontal gene acquisition events, according to a press release, emphasizing the tight margins separating bacteria of the opportunistic pathogen variety from long-term residents.

CDA JOURNAL, VOL 38, Nº3

ADA Reacts to Report on Workforce Expansion by Kellogg Foundation

In response to a report by the W.K. Kellogg Foundation advocating "midlevel" dental providers to perform certain surgical procedures in an effort to deal with the oral health access problem in the United States, the American Dental Association issued its position statement.

"We agree that innovations to the dental team can help alleviate these disparities, said Ron Tankersley, DDS, ADA president. "We disagree, however, with the foundation's recent report that recommends expanding the functions of nondentists to include surgical procedures."

The report, *Training New Dental Health Providers in the U.S.,* which was written by Burton L. Edelstein, DDS, MPH, president of the Children's Dental Health Project, a nonprofit pediatric oral health policy organization, looks at the various provider types, ranging from the basic and expanded function of dental assistants; the basic and expanded functions of dental hygienists; international dental therapists and dental hygienist/therapists; Alaska's dental health aide therapists; Minnesota's basic and advanced dental therapists; and the ADA's community dental health coordinator in the context of changing and new roles for those positions to create "midlevel provider" models, according to a press release.

In the ADA's response, Tankersley outlined the ADA's stance on workforce innovations, emphasizing that any new dental team member should focus on prevention and education, that "ultimately will be the primary factors in stemming the tide of untreated disease," adding, "The ADA's commitment to this principle is evidenced by our creating an educational curriculum and funding educational programs for Community Dental Health Coordinators, whose primary functions will be education, disease prevention, and linking those patients in greatest need of restorative care with dentists who are willing to provide that care."

To boost access to dental care, Tankersley called for a reinstatement and more funding for state and federal health programs.

Be Wise: Protect Your Tamper-Proof Pads

As mandated by the federal government, prescription pads and prescription paper that are tamper-resistant must be used for all Medicaid prescriptions. However, an increasing number of dental practices across the country are opting to use similar tamper-proof pads for other types of insurance as a way to protect themselves.

Should a tamper-proof prescription pad be photocopied, a word, once hidden, such as "Void," emerges. The same effect occurs with the word "Secure" should the pad be rubbed or heated. What's more, numeric identifiers can be used to invalidate pads that are stolen or lost, according to an ADA press release.

Additional features include using penetrating magnetic ink in printing the practice's information. This helps thwart the chemical listing during a forgery attempt. The paper itself is tamper-resistant. An attempt to alter the script will result in telltale signs of tampering as the paper has identical safety features as the pads.

For more information, go to dentalrecord.com/tamper_proof.php or call The Dental Record at 800-243-4675. The Dental Record is the sole online and paper dental forms company endorsed for ADA members by ADA Business Resources.

CDA PRESENTS

SHOW HIGHLIGHTS

ANA10

ANAHEIM, CA MAY 13-16, 2010

The Art and Science of Dentistry in the Heart and Soul of Southern California

World-renowned speakers

Be inspired by two of the masters in restorative surgery, **Terry Tanaka, DDS** and **Harald Heymann, DDS.** Each is also a featured guest at the two **Exclusive Access Luncheons.**

An exhibit hall brimming with possibilities

With about **600 vendors** and **countless new product launches,** the exhibit hall has everything your office needs to stay ahead of the curve in dentistry.

Hands-on laser workshops

Lasers are quickly becoming a dentist's most useful instrument. Gain **hands-on experience** at the **Wonderful World of Lasers.**

The sun and fun of Anaheim

Fun for the whole family, *CDA Presents* is a short hop to **Disneyland, Knott's Berry Farm,** the beach and more.

cda PRESENTS

Register by **April 2** to have your materials mailed in advance.

Simply visit **cdapresents.com**

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

REQUIRED COURSES

California Dental Practice Act and Infection Control — Ticketed Admission Only

The Dental Board of California mandates continuing education in infection control and the California Dental Practice Act. Every renewal cycle, California law requires licensed dentists and specified allied dental health professionals to complete 2 units in infection control and 2 units in the California Dental Practice Act in Category I. CDA is proud to present the following courses that will fulfill these required units for license renewal.

Please note:

- Admission to these C.E. courses will be by ticket only.
- Seating is limited. Tickets will be sold on a first-come, first-served basis.
- You may purchase your ticket in advance by completing the registration form or registering online. Tickets are $20 and will guarantee your seat in the course.
- If available, tickets will also be sold on-site at the Ticket Booth located in the registration area of the Anaheim Convention Center.
- There will be no late entries allowed. The California mandatory education requires 2 full hours for credit. It is strongly recommended that you arrive a minimum of 15 minutes in advance of the published starting time.
- Licensees are only required to attend one class on the California Dental Practice Act and one class on infection control each renewal period.

Infection Control for California

Dental Board requirement for 2 units: This program provides you with the latest educational requirements specific to CCR section 1005, the Dental Board of California Infection Control Regulations, to include handwashing techniques, sterilization and disinfection protocols. Also discussed will be the Cal-OSHA bloodborne pathogen standard, California Department of Health services waste management and CDC/ADA recommendations. Note: The 2-hour course does not meet the new Infection Control education requirement for unlicensed dental assistants.

California Dental Practice Act

Dental Board requirement for 2 units: This seminar meets the new C.E. requirement for California Dental Practice Act education, including the new one-time course requirement for unlicensed dental assistants. It discusses information and updates to the Dental Practice Act regulations on scope of practice, acts in violation of the Dental Practice Act and attending regulations, and other statutory mandates relating to the dental practice. This includes utilization and scope of practice for auxiliaries; scope of practice for dentists; laws governing the prescribing of drugs; citations, fines, revocation and suspension; and license renewal.

New Educational Requirements for Unlicensed Dental Assistants and Other Office Personnel

Beginning January 2010, dental assistants or any other individual in the dental office performing any of the duties of a dental assistant will have a ONE-TIME only educational requirement to complete the existing 2-hour California Dental Practice Act course and a new 8-hour comprehensive Infection Control course. Additionally, they will be required to maintain a current, basic life support certificate. CDA is currently working with the Dental Board of California to clarify questions in order to implement the new Infection Control course requirement. It is CDA's plan to have tools available for local dental societies and individual CDA members who may wish to become providers of the 8-hour Infection Control course.

Note: The 2-hour infection control course required of all licensed personnel (dentists, registered dental hygienists and registered dental assistants) for licensure renewal does not meet infection control requirement.

Prepaid Early Bird Parking

To make your parking experience easier, CDA is offering the opportunity to purchase parking at the Anaheim Convention Center in advance. If you arrive by 8 a.m., this will guarantee a parking space with the added convenience of not worrying about having cash on hand. Purchase the tickets along with your registration.

The following conditions apply:

- Tickets are $12 per day and are available for Thursday, Friday, Saturday and Sunday.
- Arrive by 8 a.m. — prepaid parking spaces will not be honored after that time.
- Parking passes are nonrefundable. Refunds cannot be given for lost or forgotten passes.
- Original passes must be used.
- Passes must be surrendered upon entry to the lot.
- Passes are only valid at the Anaheim Convention Center. They cannot be used at off-site parking or Disney lots.

Traffic and Parking Recommendations

If you are driving to the Convention Center, traffic is anticipated to be heaviest on Friday morning. To minimize any inconvenience, **early arrival is strongly recommended.** The peak traffic and parking time is projected to be from 8 to 11 a.m. Please watch the traffic control signs as you exit the freeway for the most updated parking information. Early arrival is also recommended for Saturday.

Off-Site Parking

CDA is working to secure off-site parking near the freeway exits with complimentary shuttle service to the Anaheim Convention Center. Due to scheduling of events at these venues, this can only be confirmed within a few weeks of our meeting. Please watch for additional information in your badge mailing, attendee e-mails or visit us at cdapresents.com for updated instructions the week prior to the meeting.

Prepaid Food Vouchers

Treat your staff to lunch with vouchers for the Anaheim Convention Center concession areas. Available in increments of $10, vouchers allow a prepaid, hassle-free option to grab something quick or sit down and enjoy a meal with your team while attending the exhibit hall or between C.E. courses. Menu options include specialty coffee and breakfast items, Grab 'n' Go for lunch, Mexican taqueria, made-to-order sandwiches, All American Grill, barbecue, rice bowl and Freschetta pizza. Exact locations and food selections will be included in your registration packet and on cdapresents.com. These vouchers are nonrefundable and must be used for amount shown. Change cannot be given if purchase is less than $10.

Purchasing Vouchers

Purchase prepaid food and parking vouchers when you register online at cdapresents.com or by submitting the advance registration form.

PREPAID PARKING VOUCHER

Fee: $12

Event #: 057 Thursday
058 Friday
059 Saturday
060 Sunday

PREPAID FOOD VOUCHER

Fee: $10

Event #: 061

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

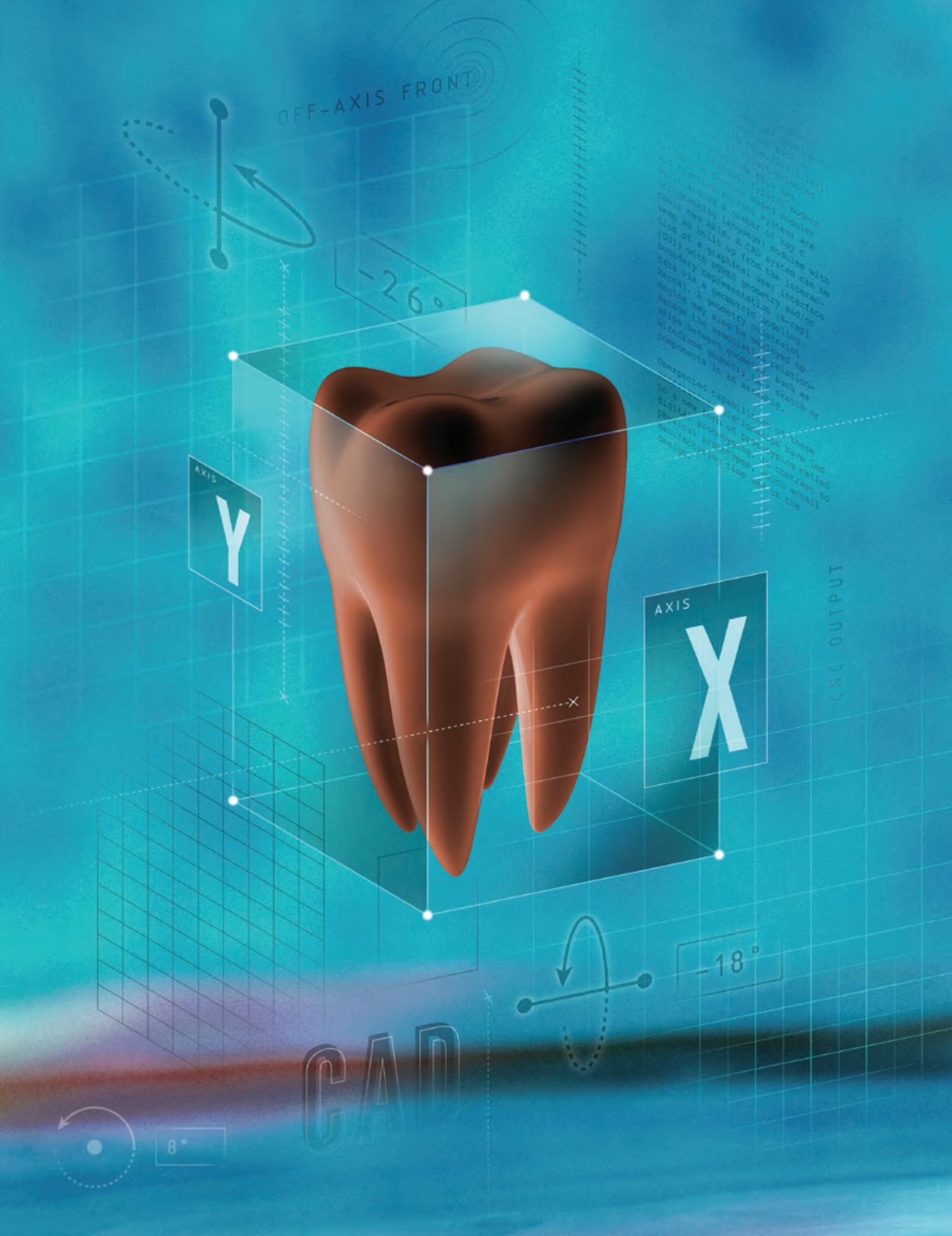
Workshops

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)


OFF-AXIS FRONT
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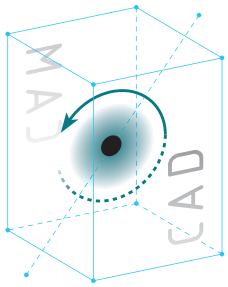

Immediate Placement and Provisionalization of a Dental Implant Utilizing the CEREC 3 CAD/CAM Protocol: A Clinical Case Report

ROBERT GOUGALOFF, DMD, AND FRED C. STALLEY, DDS

ABSTRACT Dental implant placement with immediate provisionalization is a well-established protocol with excellent success rates. Immediate provisionalization after dental implant placement is a very convenient treatment modality for the patient, especially in the esthetic zone, since removable provisionalization modalities can be avoided and the gingival architecture can also be re-established more predictably. This case report describes the use of CAD/CAM technology to facilitate the manufacture of an immediate provisional for a dental implant.

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Restoration of edentulous spaces with dental implants is a well-accepted treatment modality within the scientific community.[1-5] Endosseous implants were initially utilized to restore fully edentulous patients, however, eventually it was recognized that implants also offer a successful treatment modality for partially edentulous patients.[6-8] More recently, endosseous implants have become increasingly popular for single-tooth restorations in general and for immediate postextraction scenarios in particular.[9-16]

Individual implant restorations can have several advantages over the more traditional modalities utilizing fixed partial dentures. The teeth adjacent to the edentulous site do not have to be prepared, and thus are biomechanically and often periodontally compromised. The long-term esthetics of the edentulous space tends to be maintained better, due to better hard- and soft-tissue maintenance. Additionally, the average fixed partial denture life span of seven to 10 years is well-surpassed by that of implant-supported restorations.[17,18]

Recent studies have also reported very high success rates for immediately placed dental implants into fresh extraction sockets, followed by immediate provisionalization.[19-22] Immediate provisionalization eliminates the

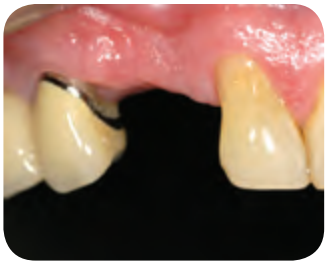

FIGURE 1. The initial condition of the No. 6 edentulous area.

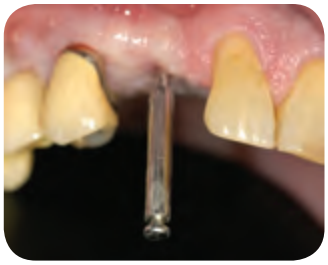

FIGURE 2. The surgical placement of the pilot drill.

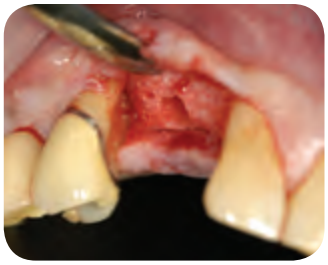

FIGURE 3. The finalized osteotomy.

necessity of a provisional removable denture during the healing and integration phase of the implant, and has also shown to better maintain the original gingival and osseous architecture.

The manufacture of a chairside immediate provisional during surgery can often pose a great challenge to the practitioner. Great care must be taken to satisfy the demands for proper healing of the delicate gingival tissues around the crest portion of the implant. The emergence profile of the provisional crown should mimic the trajectory of the original tooth and the interface between the provisional abutment and the provisional crown should be such that it promotes healing rather than cause inflammation. Lastly, it needs to be esthetically pleasing to the patient, especially when the implant is being placed into the esthetic zone. The manufacture of a proper immediate provisional crown can therefore command a great deal of chairtime and pose a particular challenge with respect to the coordination of different members of the implant reconstructive team.

Computer-aided Design/Computer-aided Manufacture, CAD/CAM, technology has become increasingly popular in the field of restorative dentistry during the last decade.[23-26] This technology utilizes three separate steps to manufacture a restorative component such as an inlay, onlay, or crown. The first step is the data acquisition of a prepared tooth (usually an optical impression). The second step is the design of the final restoration, and the final step is the milling and/or processing of the restoration. User friendliness of in-office CAD/CAM systems has dramatically improved over the last decade and recent studies have reported a high degree of marginal accuracy in the resulting restorations.[27-29]

CAD/CAM applications have also found many applications in implant dentistry in recent years. Procera crowns and later abutments were among the first CAD/CAM applications for implant dentistry, facilitating the overall prosthetic process in implant dentistry.[30-32]

The Procera protocol requires the scanning to be done at a laboratory that offers this particular service. Scanning can be performed from the level of a prepared abutment, a wax-contour abutment, or just the level of the implant shoulder. The CAD/CAM process will eventually produce a custom-milled abutment and/or a milled ceramic coping onto which the laboratory technician can then stack the porcelain.

Another CAD/CAM application in implant dentistry is the utilization of CT scan data to either manufacture 3-D models of hard-tissue structures or to implement computer-guided surgery via CAD/CAM-derived surgical guides, such as the NobelGuide protocol or the SimPlant SurgiGuide protocol.[33-38]

Several recent publications described the utilization of CAD/CAM systems to manufacture the final restorations on single-tooth dental implants with great success.[39-41] The protocol described in the following case report is designed to facilitate the chairside manufacture of an immediate provisional crown, utilizing the CEREC 3-D CAD/CAM system after a single-tooth implant placement.

Materials and Methods

A healthy 65-year-old male patient presented with a missing tooth No. 6 (**FIGURE 1**). All treatment options and their respective risks and benefits were discussed with the patient. The patient opted to have the edentulous area restored with a dental implant and an immediate temporary crown provided, if feasible.

Preliminary Procedure

The patient was properly assessed with respect to his medical history, allergy status, and current medications, in order to establish sound candidacy for dental implant treatment. A preliminary cone beam scan was taken (Sirona Gallileos Comfort, Sirona Dental Systems LLC, Charlotte, N.C.) to gain more diagnostic information about the cross-sectional nature of the area in question. Due to the 3-D nature of the scan and the virtual representation of the neighboring and opposing teeth, a preprosthetic wax-up of No. 6 was not deemed necessary. The patient was then anesthetized with local anesthetic (Septocaine 4 percent, 1;100,000 epinephrine, Septodont, France) via local infiltration. A bite registration was taken with Take 1 Advanced bite registration material (Kerr Corporation, Romulus, Mich.) and trimmed.

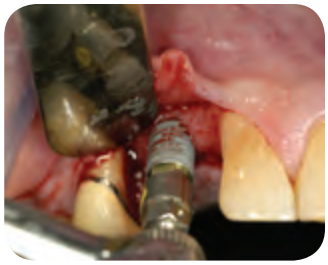

FIGURE 4. The implant is inserted into the osteotomy site.

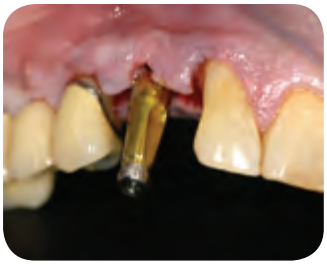

FIGURE 5. A fixture-level impression is made with a fixture-level coping.

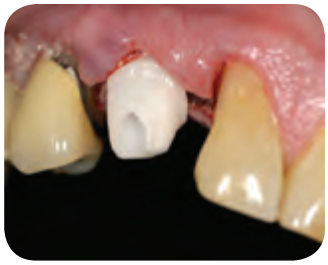

FIGURE 6. A proper ceramic abutment was chosen, prepared, and secured to the implant fixture.

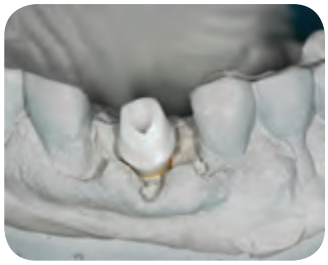

FIGURE 7. The prepared abutment was placed on the stone cast and subsequently scanned.

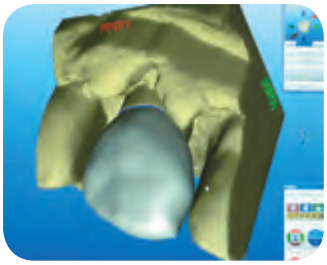

FIGURE 8. The CEREC software proposes a possible provisional crown.

FIGURE 9. The provisional crown after the milling process has been completed.

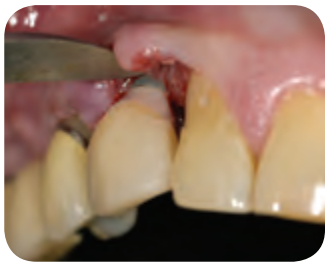

FIGURE 10. The milled provisional crown was checked for marginal integrity to the abutment.

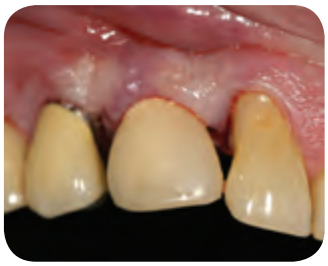

FIGURE 11. The finished provisional crown was cemented and the tissues sutured and tied off lingually.

Surgical Procedure

An initial pilot bur was used to gain purchase for the successive depth and enlargement drills within the parameters established for proper position implant placement (**FIGURE 2**). After sequencing through all enlargement drills and proper flap reflection, the final osteotomy was established according to current standards of care and guidelines (**FIGURE 3**). A Nobel Biocare Replace Select (tapered) implant fixture, 13 mm in length and 4.3 mm in diameter (Nobel Biocare USA, LLC, Yorba Linda, Calif.) was secured in the osteotomy with a recommended torque of 35-40 Ncm (**FIGURE 4**).

Provisionalization Procedure

Once the implant was properly placed, a fixture-level impression was made, utilizing the appropriate transfer coping and analog (Nobel Biocare) (**FIGURE 5**). The impression was then poured in quick-set stone and subsequently trimmed. While the stone was setting, the appropriate temporary ceramic abutment (Nobel Biocare) was chosen, trimmed, and properly shaped (**FIGURE 6**). The bite registration was placed on the stone cast, just covering the edentulous area and after proper application of contrast powder (CEREC Contrast Powder, Sirona Dental Systems, LLC, Charlotte, N.C.) an "antagonist scan" was taken with the camera of a CEREC 3 (Sirona Dental Systems) CAD/CAM unit.

The ceramic abutment was then transferred to the stone cast and placed on the analog (**FIGURE 7**). The provisional abutment and the adjacent teeth on the stone cast were again properly prepared with contrast powder and an optical impression was obtained with the camera unit, which was then saved under the "Preparation" image in the CEREC 3 software. Based on the information from the original "antagonist scan" and the newly prepared "abutment scan," the software was then instructed to render a proposed crown for the scanned abutment (**FIGURE 8**).

Slight modifications were undertaken with respect to occlusal and interproximal contacts, and the proposed crown was "sent" to the milling unit. A Paradigm composite block (3M ESPE Dental Products, St. Paul, Minn.) of a proper shade was inserted into the milling unit and the milling process was initiated. The milling process was completed in approximately four minutes (**FIGURE 9**).

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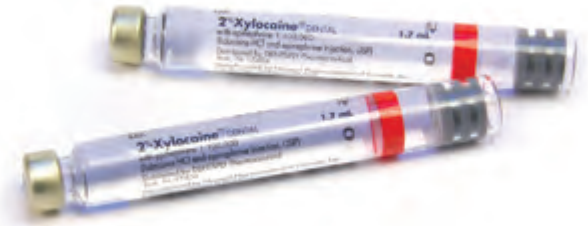
Administering local anesthesia is easy,



it's the other five jobs that are mind numbing.

CEO. CFO. Marketing director. Benefit coordinator. HR manager. If only there was a resource that could help you with the business aspect of running a practice. Enter the California Dental Association's Compass. A Web site that offers a host of resources, blogs, forums and podcasts designed to make the business of dentistry a lot less painful.

cdacompass.com | where smart dentists get smarter.™

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The resulting crown was polished and the marginal integrity to the ceramic abutment was checked (**FIGURE 10**). The provisional abutment was reattached to the implant and the composite provisional was tried in for proper fit and contours. No adjustments were necessary. The provisional crown was finally cemented with a noneugenol provisional cement (SensiTemp Resin, Sultan Chemists Inc., Englewood, N.J.) (**FIGURE 11**).

Discussion

This case report demonstrates the utilization of CAD/CAM technology to facilitate the manufacture of an immediate provisional crown following placement of a single-tooth dental implant. The impending loss of a tooth, especially in the esthetic zone, can be an emotional event to the patient. Traditional provisionalization solutions to post-implant placement involved either the manufacture of a temporary removable appliance or a temporary Maryland-type bridge, bonded to the adjacent teeth.

The removable appliance option has traditionally not been well-received by patients due to retention, phonetic and esthetic issues, and patience acceptance. The Maryland-type bridge offers improved retention and esthetics, however, the fact remains that adjacent teeth are used as anchors and has a higher cost, which often also makes this a compromising choice for patients.

Neither of these options addresses the ability to stabilize and possibly even maintain both the hard- and soft-tissue architecture around the newly placed dental implant. A provisional crown, which is connected directly to the implant, can offer a practical solution to the previously referenced shortcomings of the traditional provisionalization methods. Additionally, the adjacent teeth are not affected by an implant-supported provisional, there are typically no phonetic problems involved, the retention is excellent, provided that a clean and adequate cement surface is at hand, and it has been shown that the soft- and hard-tissue architecture can be better maintained through an immediate provisional crown.[42-44]

It is important to note that the lack of proper insertion torque of the dental implant would be an absolute contraindication for an immediate provisional abutment and crown. It is recommended that the minimum insertion torque for immediate provisionalization is between 30 and 35 Ncm. Furthermore, the provisional crown needs to be carefully adjusted so that centric contacts are minimal and working side and nonworking side excursive contacts are absent. The occlusal scheme for the provisional implant crown in a canine area should be that of posterior group function, in order to protect the implant from inadvertent overload during the integration phase. Lastly, the patient should be instructed to avoid direct masticatory contact with the provisional crown during the first eight weeks.

THE PROVISIONAL CROWN needs to be carefully adjusted so that centric contacts are minimal and working side and nonworking side excursive contacts are absent.

Historically, the manufacture of an immediate provisional crown for a dental implant has been met with challenges. The "team approach" frequently required the restorative dentist to be present at the time of surgery with all the equipment necessary for the manufacture of a provisional crown. In the opposite approach, the surgeon had to perform the surgery often at the restorative dentist's office so that the provisional crown could be manufactured more efficiently; however, this required the surgeon to bring all of his surgical equipment. Even if the surgery and the provisionalization were performed by the same person, certain challenges had to be met, such as a smooth interface between the abutment and the provisional, proper esthetics, as well as proper occlusion and excursive clearances.

The utilization of CAD/CAM technology offers an efficient solution to such challenges. The marginal adaptation is usually the most difficult aspect to satisfy in any provisionalization. Recent studies have shown that the marginal adaptation of CEREC 3-D CAD/CAM restorations using Paradigm MZ100 composite polymer blocks is on the average less than 100 micron, which is clinically acceptable, especially for a provisional crown.[28,45]

Conclusions

CAD/CAM systems are gaining momentum in dentistry. The use of a CAD/CAM system for the manufacture of a provisional crown at the time of the placement of a dental implant can reduce the chairtime significantly and produce superior results. The CAD/CAM unit could also be used to manufacture a final crown, utilizing a zirconia block instead of a composite milling block. However, it is very difficult to predict the final settlement level of the gingival crest along the implant crown/abutment surfaces.

Additionally, the CAD/CAM unit is usually programmed to include lighter contacts for the provisional crown than for the final crown, once the implant has been given proper time to integrate. With better software and hardware upgrades, as well as better imaging technology, it may be possible in the future to not only take a direct optical impression, but it may also be possible to have the abutment and crown manufactured via CAD/CAM technology. ■■■■

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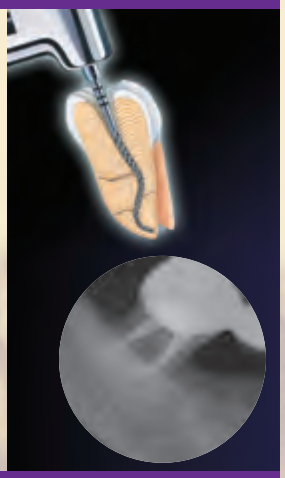

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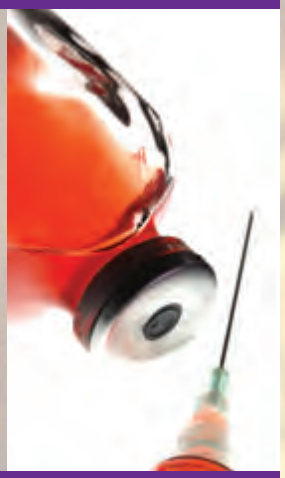

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CDA JOURNAL, VOL 38, Nº3

The Effect of Background and Ceramic Thickness on the Color of an All-Ceramic Restorative System

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ABSTRACT **Objective:** Evaluation of the color change of a semileucent ceramic system with different core-veneer thicknesses and backgrounds. **Materials and Methods:** Thirty disk-shaped specimens with different thicknesses of core-veneer were prepared with IPS-Empress 2 and IPS-Eris glass ceramic and four backgrounds were prepared. **Results:** Color differences were significantly influenced by total ceramic thicknesses and backgrounds ($p<0.001$). **Conclusion:** Thickness and backgrounds caused a detectable color mismatch in clinically relevant core-veneer thicknesses of IPS Empress 2.

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The restoration of discolored teeth is a common yet challenging practice for restorative dentists. An alternative to the traditional use of ceramics fused to metal substructures is desirable, given the demand for improved esthetics and strength.[1] Elimination of the opaque metal substructure and metal margins through the use of all-ceramic systems offers the advantage of more natural-looking restorations due to an increase in light transmission and depth of translucency.[2,3] The design of most all-ceramic systems includes a high-strength core and a relatively weaker ceramic veneer used to establish the final anatomy and color.[4]

Heffernan et al. investigated several all-ceramic cores and core-veneer systems and identified a significant range of translucency at clinically relevant thicknesses.[5,6] In addition to the color and translucency of the ceramic system, other factors including thickness of the ceramics, thickness and color of the luting agent, and the color of underlying substrate affect the final match of restorations.[7-10]

In the presence of discolored substrates such as build-ups, postcores, and existing metallic restorations, shade matching can be impaired due to the shine-through effect and translucency in these materials.[11] The masking ability of ceramics is mostly a function of the optical properties of the microstructure and the relative thickness of the core-veneer system.[12]

Antonson and Anusavice investigated the contrast ratio of veneering and core ceramics and suggested that the thickness did not significantly affect translucency for less translucent ceramics (i.e., sintered alumina).[1] Shokry et al. studied the influence of varying core and veneer thickness

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in two translucent all-ceramic systems (leucite-reinforced and magnesium spinel alumina) and found that although the brightness changed inversely as a function of thickness in both systems, the change in color parameters did not follow identical patterns.[7] Vichi et al. measured the combined effect of various thicknesses of leucite-reinforced ceramic and cement over four substrates.[8] They concluded that for leucite-reinforced ceramics thicker than 2 mm, the substrate does not affect the final shade of restoration. They recommended against the use of this material in critical color-matching applications when the available space was less than 1 mm.

However, Nakamura et al. reported no color difference between leucite-reinforced ceramics against porcelain backgrounds of various shades, but observed a color difference against a gold alloy background.[13] Most studies have described a consistent effect of thickness on the shade and translucency of the ceramic materials.[3,5,7,13,14] However, the outcome is relatively unpredictable and is highly variable among different ceramic systems.

In all-ceramic systems utilizing a more opaque core, relatively poor esthetics may be encountered due to reduced light transmission. Nonetheless, at clinically available thicknesses, the effect of the abutment color should be taken into account when semitranslucent ceramics are selected.

IPS-Empress 2 (Ivoclar Vivadent, Liechtenstein) is a lithium disilicate-based glass ceramic that was developed in an attempt to extend the range of indications of these materials from inlays and crowns to three-unit anterior bridges.[15] The crystalline content of the core material is 70 percent volume and offers high-strength, relatively high-fracture toughness, and at the same time, has a higher translucency than other core materials at the same level of strength.[5,15] In clinical applications, a specific fluorapatite-containing glass ceramic (IPS Empress or IPS Eris for E2; Ivoclar Vivadent) is sintered on the core to adjust the morphology, translucency, and shade to match the natural dentition.[16]

TABLE 1

Core-Veneer Thicknesses Investigated

Samples	Core thickness (mm)	Veneer thickness (mm)	Final thickness (mm)
C8V2	0.8	0.2	1
C8V5	0.8	0.5	1.3
C8V7	0.8	0.7	1.5
C1V2	1.0	0.2	1.2
C1V5	1.0	0.5	1.5
C1V7	1.0	0.7	1.7

TABLE 2

L*, a*, and b* Values of Background Pieces

Background	code	L*	a*	b*
Gold alloy	G	69.09	5.81	21.24
Silver palladium alloy	SP	68.23	2.49	8.06
Resin composite A2 shade	A2	58.73	4.59	15.78
Resin composite A3.5 shade	A3.5	65.54	2.30	16.69

The effect of core and veneer thickness on the final color over a black and white background was previously investigated.[12-14] The intent of the present study was to spectrophotometrically evaluate the color change of lithium disilicate-based ceramic samples with changes in core and veneer thickness and abutment color. Spectrophotometry has been extensively employed in dental color research as well as other related industries.[17-20]

The null hypothesis was that the final color parameters of the ceramic are independent of the core-veneer thickness and the abutment (background) type.

Materials and Methods

Six combinations of core-veneer thickness of an all-ceramic system were prepared (TABLE 1). The spectrophotometric parameters were analyzed against four background materials (TABLE 2).

2.1. Fabrication of Ceramic Specimens

A total of 30 disc-shaped bilayered specimens were prepared from lithium disilicate hot-pressed ceramic. The samples were 17 mm in diameter with a thickness of 0.8 or 1.0 mm and a color of 100 (IPS Empress 2, Ivoclar Vivadent, Schaan, Liechtenstein). A veneering ceramic (Eris for E2, Ivoclar Vivadent) was layered onto the core discs in thicknesses of 0.2, 0.5, or 0.7 mm, with five specimens prepared at each thickness. To obtain the desired thickness, brass cylinders 17 mm in diameter and 0.9, 1.1, 1.2, 1.4, 1.5, 1.7, and 1.9 mm thick were used as references. The layers were made 0.1 to 0.2 mm thicker than the final desired dimension to compensate for shrinkage and provide for further precise adjustment.

The cores were fabricated by forming 30 wax patterns (Inlay wax, Kerr/Seyborn, Calif.) in silicone molds (Speedex putty, Coltene, Apadana Tak, Tehran) either 0.9 or 1.1 mm in depth. Sets containing three patterns were invested in an investment ring with a phosphate-bonded investment (Speed Investment, Ivoclar Vivadent) after attachment of a 3 mm-diameter

sprue to each of the patterns. The rings were bench set for 60 minutes and placed into a burnout furnace (VITA Vacumat 300, VITA Zahnfabrik, Germany) for 120 minutes. The specimens were hot-pressed in an EP600 furnace (Ivoclar Vivadent), air-cooled, divested by blasting with 80 micron glass beads at 4 bar pressure, and ultrasonically treated in an acidic cleaning liquid (Invex, Ivoclar Vivadent).

The manufacturer's instructions were followed during all procedures. The disks were polished to their final thickness with 280-1500-grit silicon carbide paper under running water. The thickness was measured using a micrometer with 0.001 mm resolution (Mitutoyo Digimatic, Kawasaki, Japan). The core discs were veneered with A1 vita shade dentin ceramic (IPS Eris for E2; Ivoclar-Vivadent). To obtain a uniform thickness, the core disks were inserted into molds to the desired depth. The dentin powder was mixed with build-up liquids and introduced to the molds with hand vibration and condensation. Excess moisture was removed with a tissue. Firing was performed according to the manufacturer's recommended procedure. The specimens were polished (Kenda Polishers, Kenda AG, Kanalstrasse, Liechtenstein) to adjust the thickness and an auto-glazing process was performed at 730-degrees Celsius.

2.2. Fabrication of Backgrounds

To simulate the clinical situation of endodontically treated teeth with post and core build-up and dentin discoloration, four backgrounds were fabricated using silicone molds 17 mm in diameter and 0.5 mm deep. Two wax patterns were formed (Inlay wax, Kerr/Seyborne) and cast in gold alloy (Degubond G, Au 86 percent, Degussa, Hanau, Germany) and silver palladium alloy (CDW-G, Au 0.2 percent and Pd 25 percent, Engelhard, Germany). The two cast discs were polished with 280-grit sandpaper to eliminate the glossy surface.

Two resin composite disks 17 mm in diameter and 2 mm thick were fabricated using A2 to represent normal dentin and A3.5 to represent discolored dentin (Gradia Direct, GC Dental Products Corp, Tokyo). The resin composite was packed into the respective mold and covered with a celluloid sheet to avoid formation of an oxygen inhibition layer. To make the outer surface of the disk smooth and bubble-free, a glass plate was placed on the top of the packed mold. The specimens were polymerized by exposure to a light-cure unit (Contour, Coltene/Whaledent, N.J.) for 60 seconds from above and 60 seconds from below.

AT CLINICALLY
available thicknesses, the effect of the abutment color should be taken into account when semitranslucent ceramics are selected.

2.3. Spectrophotometric Analysis

The color measurements were performed using a spectrophotometer unit (Color Eye 7000 A, GretagMacbeth Instrument Corp, N.Y.). Measurements were recorded at a 10-degree observation angle using a D65 illumination source, the manufacturer-supplied software (Optiview Lite), and a specular excluded (SCE) configuration to compensate for errors caused by surface glaze.

Before each measurement, the spectrophotometer was calibrated using the calibration tile supplied by the manufacturer. The ceramic specimens were placed individually over each of the background discs. In order to provide good optical contact, a drop of distilled water was placed between the discs and the respective backgrounds. The CIE L*, a*, and b* values of each combination were recorded three times. In CIE colorimetry color is quantified using the parameters of luminosity (L*) and chromaticity along the red-green (a*) and yellow-blue (b*) axes. The color difference (ΔE) between the average values of the ceramic specimens and the A2 background was determined using the following formula: $\Delta E=[(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2]^{1/2}$.

Three-way analysis of variance (ANOVA) was used to analyze the effects of core and veneer thickness and substrate color with α=0.05. Within group differences were evaluated using Tukey's multiple comparison test. All statistical evaluations were performed using computer software (SPSS version 11.5, SPSS Inc, Chicago).

Results

The average values of CIE L*, a*, and b* for each core/veneer/background combination are depicted graphically in **FIGURES 1-3**. The mean color differences (ΔE) between the A2 background and the three other backgrounds and the p-values are listed in **TABLES 3 AND 4**. In general, the L* values of the ceramic background combinations decreased with increasing thickness of the ceramic disks.

However, L* remained unchanged for all combinations of C.8V.2 and C.8V.7. The highest changes were observed in the G groups, while the lowest changes occurred in the A3.5 group. The ΔL* value was significantly different between specimens ($p<0.05$). The values of a* tended to shift from negative values (green) toward the positive range (red) when the total thickness of the specimens increased. The Δa* value was significantly different between

TABLE 3

ΔL, Δa, Δb, and ΔE Values Between the Samples With A2 Background

Backgrounds	A3.5				Silver Palladium Alloy				Gold Alloy
Specimens	ΔL	Δa*	Δb*	ΔE	ΔL	Δa*	Δb*	ΔE	ΔL
C8V2	1.12(0.07)	0.24(0.04)	1.32(0.82)	1.75(0.11)	0.37(0.08)	0.36(0.05)	0.89(0.11)	1.21(0.54)	0.51(0.35)
C8V5	0.87(0.07)	0.29(0.02)	1.02(0.07)	1.33(0.10)	0.29(0.06)	0.32(0.02)	0.63(0.05)	0.77(0.07)	0.33(0.32)
C8V7	0.61(0.06)	0.29(0.02)	0.82(0.10)	1.06(0.11)	0.27(0.04)	0.32(0.03)	0.53(0.05)	0.68(0.67)	0.37(0.02)
C1V2	0.82(0.12)	0.21(0.05)	0.96(0.12)	1.26(0.18)	0.33(0.09)	0.32(0.04)	0.67(0.06)	0.82(0.12)	0.52(0.18)
C1V5	0.67(0.07)	0.29(0.03)	0.90(0.04)	1.16(0.63)	0.29(0.02)	0.33(0.03)	0.60(0.05)	0.73(0.04)	0.41(0.11)
C1V7	0.45(0.04)	0.26(0.03)	0.65(0.07)	0.83(0.08)	0.20(0.05)	0.25(0.03)	0.38(0.06)	0.49(0.08)	0.18(0.15)

TABLE 4

Results of Three-Way ANOVA for Mean Color Differences of Combinations to A2 Background (α=0.05)

Variables		ΔL	Δa*	Δb*	ΔE
Core thickness (mm)	0.8 vs. 1.0	P=0.004	P=0.013	P=0.003	P<0.001
Veneer thickness (mm)	0.2 vs. 0.5	P<0.001	P=0.782	P=0.018	P<0.001
	0.2 vs. 0.7	P<0.001	P=0.046	P<0.001	P<0.001
	0.5 vs. 0.7	P=0.003	P=0.190	P=0.057	P<0.001
Backgrounds	SP vs. G	P=0.030	P<0.001	P=0.306	P=0.020
	SP vs. A3.5	P<0.001	P=0.217	P<0.001	P<0.001
	A3.5 vs. G	P<0.001	P<0.001	P<0.001	P<0.001

all background types (p<0.000) except between the composite and SP (p=0.22). The b* values increased as the total thickness of the discs increased regardless of background type. Δb* was significantly different between all backgrounds (p<0.000) except between G and SP (p=0.30).

The core thickness, veneer thickness, and background type all had a significant influence on the final color of the specimens (p<0.000). However, the interaction between any two or all three factors was not significant (p>0.05). ΔE was significantly higher with A3.5 than with gold or SP backgrounds (p<0.000). The lowest ΔE value was obtained with the SP group (0.49), while specimens with the least total thickness (C.8V.2) over the A3.5 background displayed the highest value of ΔE (0.75).

All of the thinnest specimens (C.8V.2) displayed clinically perceptible color changes (ΔE>1). However, none of the C.8V.7 samples exhibited an identifiable color difference. At increased core thicknesses, only the C1V2 specimens over the A3.5 background showed a perceptible ΔE.

Discussion

The purpose of the present in vitro study was to evaluate the influence of core and veneer thickness on the color of all-ceramic materials against a variety of backgrounds. A clinical situation was simulated in which an attempt was made to match the color of an all-ceramic (IPS Empress 2, Vivadent) restoration over normal dentin in the common shade of A2 with discolored dentin and metal cast post and core materials. Since it was revealed that the core and veneer thickness as well as the background had a significant influence on the resultant color of the all-ceramic specimens, the null hypothesis of the research was rejected.

Due to the high crystalline content of approximately 70 percent volume IPS Empress 2 possesses a high strength and toughness, which results in better clinical durability.[2] The high crystalline content does not adversely affect the translucency of the material because the refractive index closely matches that of the matrix.[5] Contrast ratios of 0.55 to 0.74 have been reported for this material.[5,15] Based on these values IPS Empress glass-ceramic is more opaque than leucite-reinforced ceramics, but more translucent than alumina or zirconia ceramics, which offer more natural-looking restorations.

Parametric evaluation of color in terms of CIE values offers more precise color measurement than the Munsell system because the CIE parameters are based on the spectral power distribution, SPD, of the light reflected from the colored object and also account for the wavelength sensitivity curves of the human eye. The L* value decreased as the total thickness of the specimens increased, making thicker specimens appear darker. This finding is well-documented in the literature, and may be explained by increased absorption of incident light in thicker ceramic layers leading to a reduction in the amount of reflected light.[7,13,14]

When the color match to an A2 background was considered, the difference was greatest in the A3.5 and silver-palladium groups, while the gold group

Δa*	Δb*	ΔE
0.76(0.26)	0.81(0.50)	1.27(0.15)
0.67(0.29)	0.53(0.50)	1.03(0.40)
0.56(0.19)	0.40(0.4)	0.84(0.35)
0.65(0.21)	0.52(0.28)	1.02(0.19)
0.51(0.20)	0.43(0.41)	0.85(0.24)
0.38(0.12)	0.43(0.35)	0.65(0.30)

was intermediate. This differs from the results of Nakamura et al. who found a higher L* value with a gold alloy background in comparison with porcelain in shades A1 through A4.[13] No color difference was observed between the various porcelain shades. Light reflection from the surface of the metal background was suggested as a contributing factor. In the present study, the metal alloy disks were not polished. The difference in the degree of polish of the metal backgrounds could explain the difference in the results of these studies. Besides the difference in background preparation, the specimens in the Nakamura study were not veneered.[13]

Veneering the core material could affect the ability of the core to mask the background color.[12] In a study by Li et al., resin composite core build-ups in different shades changed the final color of IPS Empress 2, In Ceram, and Vita Mark2 overlay ceramics as much as ΔE>3.[11] These findings suggest that the background and its surface texture have a strong influence on the final color of restorations.

The use of an A3.5 composite disk to represent discolored dentin may not be valid as natural dentin differs from resin composite material. More controlled clinical investigations are required to evaluate the effect of discolored dentin on the resultant color of ceramic systems. In the present study, there was a color shift to red (Δa*) and yellow (Δb*) as the specimens increased in thickness. This is consistent with previous

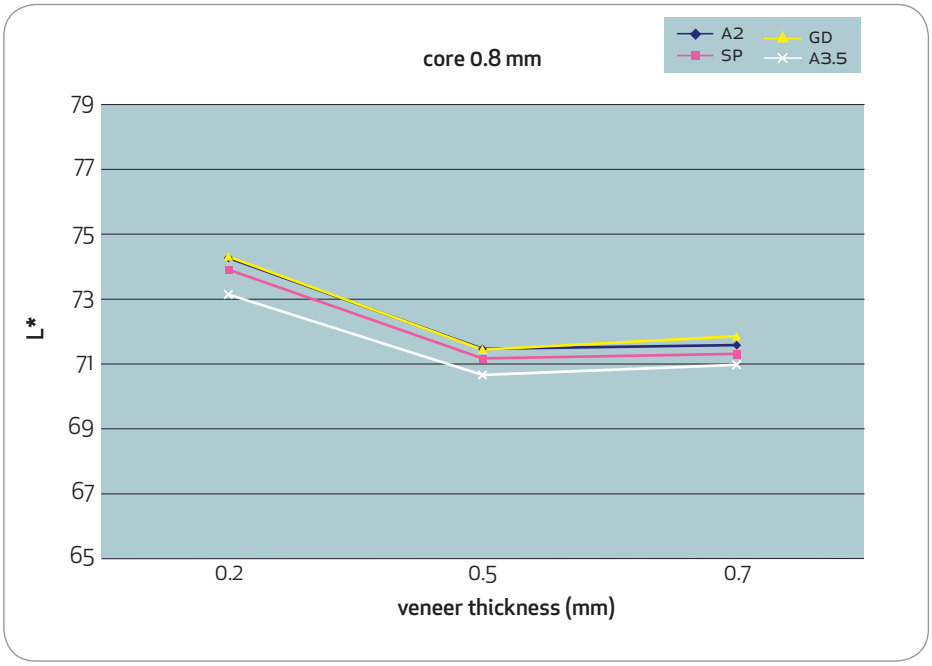

FIGURE 1A.

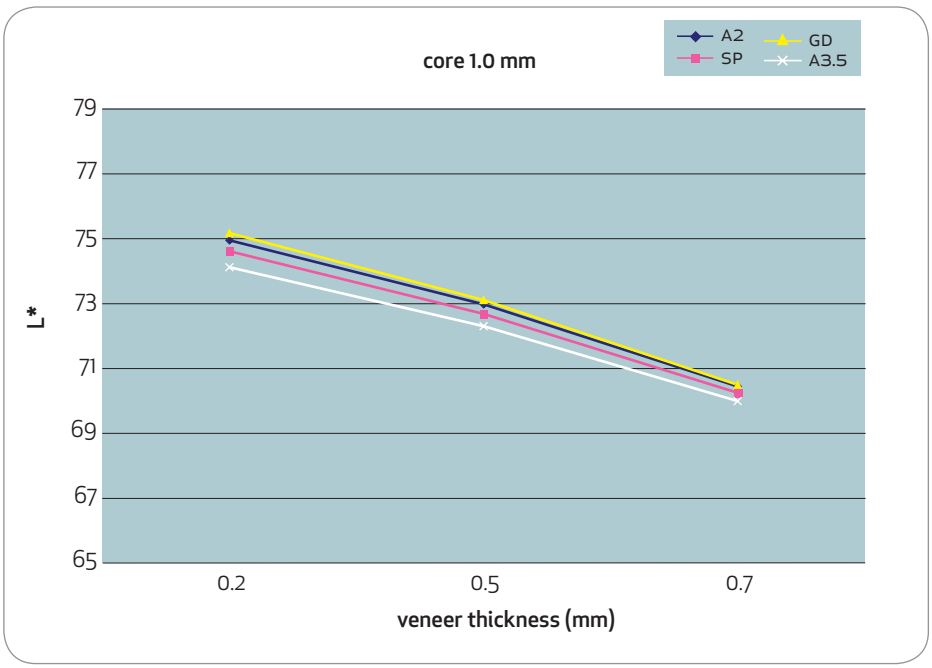

FIGURE 1B.

FIGURES 1A AND B. The L* values of ceramic specimens against four types of background.

reports.[9,12,14] However, other factors such as contrast ratio, the original shade of ceramic, the composition and the opalescence property of the ceramic also affect the magnitude of Δa* and Δb*.[14]

For instance, in a study by Ozturk et al., Δa* and Δb* increased with thickness for IPS e.max specimens, while for zirconia specimens b* did not vary.[3] It has been shown that in reflective background a translucent/opalescent material (such as IPS Eris veneer glass ceramic) may assume a yellowish (positive b*) and reddish (positive a*) hue.[10] The magnitude of ΔE that is perceivable and acceptable has been investigated in several dental color experiments. However, this threshold is not well-defined for Δa* and Δb*. Based on the results of visual inspection by prosthodontists, Douglas and Brewer proposed a tolerance of 1.1 and 2.1 for Δa* and Δb* respectively, while Lindsey et al. recommended values of 1.0 and 2.6.[17,18]

Regarding the Δa* and Δb* values of the present study, none of the combinations reached the threshold values suggested in the previous papers. After reviewing the dental color research on the magnitude of perceivable mismatch and acceptable values of ΔE, two conclusions may be drawn.

First, regardless of skill, observers were more tolerant in clinical settings than in vitro experiments. Second, the threshold of detectable color difference is significantly lower than the acceptable level. A range of 1-2.76 ΔE units was classed as a mismatch in several studies.[17] For the present study, the following grading of ΔE was used. This system has also been adopted by Vichi et al. and Barath et al:[8,14]

ΔE<1 = not detectable,

1<ΔE≤2 = detectable by nonskilled observer, though clinically acceptable, and

ΔE>2 = clinically unacceptable.

Regardless of the background, all specimens with core and veneer thickness-

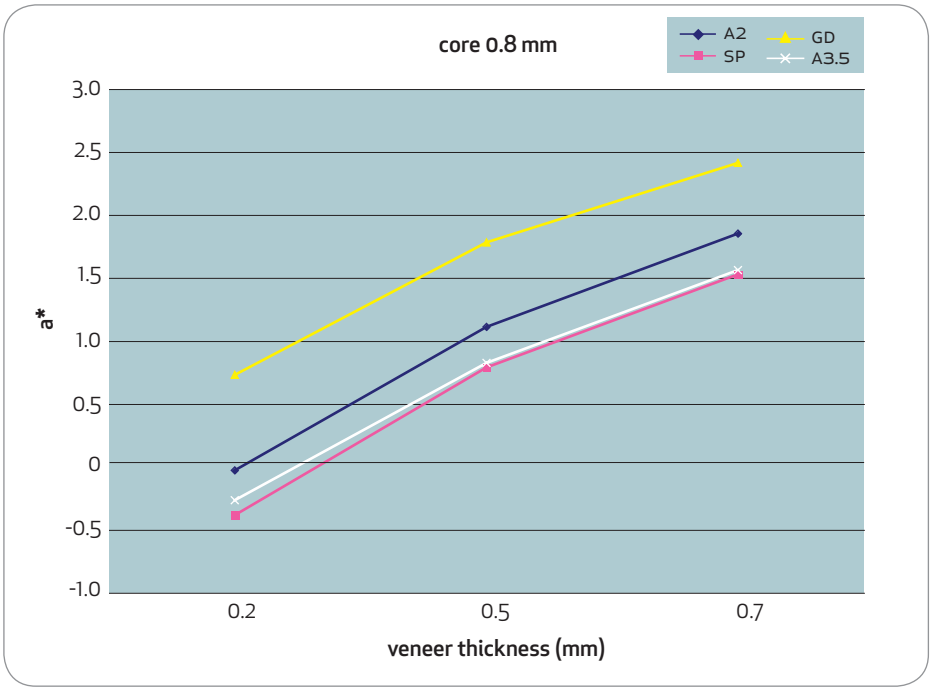

FIGURE 2A.

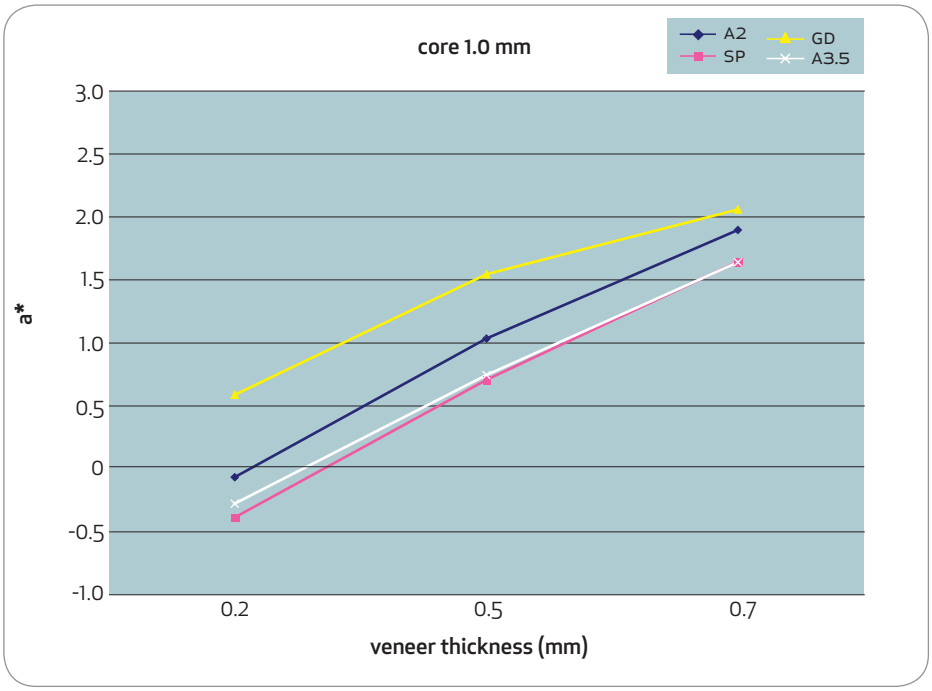

FIGURE 2B.

FIGURES 2A AND B. The a* values of ceramic specimens against four types of background.

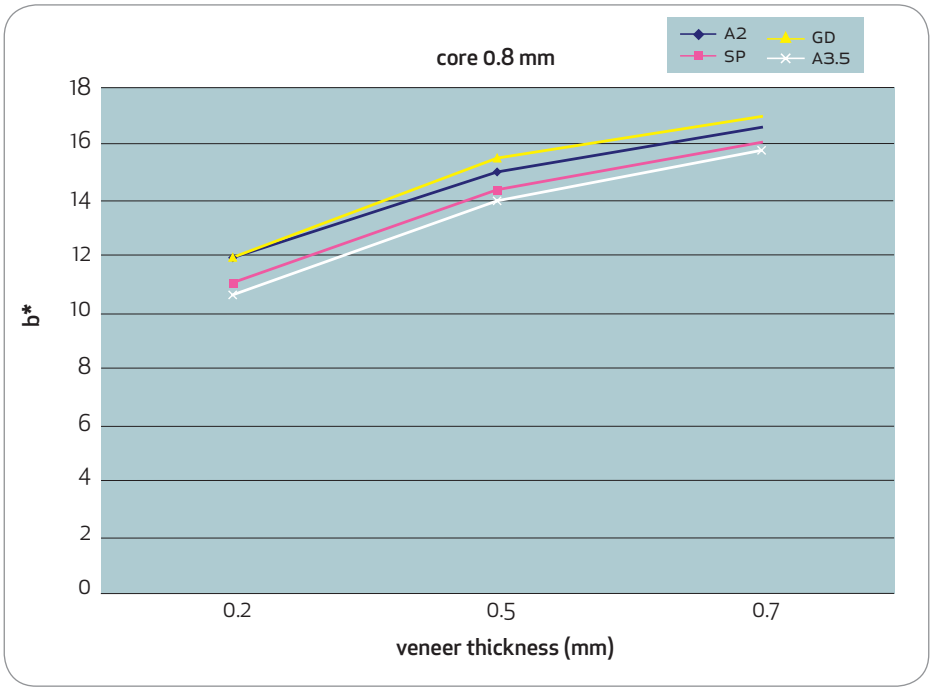

FIGURE 3A.

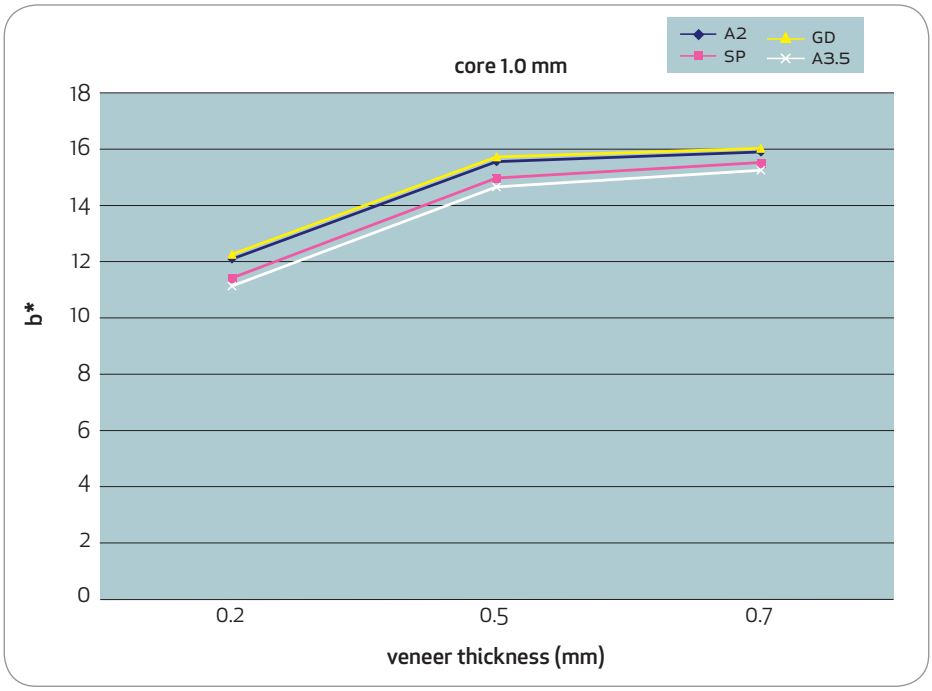

FIGURE 3B.

FIGURES 3A AND B. The b* values of ceramic specimens against four types of background.

es of 0.8 mm and 0.2 mm exhibited ΔE values between 1 and 1.5. Increasing the veneer thickness to 0.5 mm compensated for color changes on the silver-palladium background, and 0.7 mm was sufficient to compensate for the gold alloy background as well. However, these thicknesses did not mask the A3.5 composite. These findings suggest caution when a tooth is prepared for an all-ceramic restoration.

Ordinarily, a thickness of 1.0 mm is required in the cervical region. According to the results of this study, the background shade will be perceptible through the ceramic at this thickness. However, all of the above measurements fall into the acceptable range of color mismatch.

Barath et al. suggested that the color of the luting cement had a significant effect on the final color of all-ceramic translucent materials.[14] However, Vichi et al. reported that the influence of cement shade was limited, and in the present study the luting agent was not considered.[8] However, the color effect of luting cement may be examined in further studies.

Conclusions

Within the limitations of the present study the following conclusions could be drawn:

1. The core and veneer thickness exerted a significant effect on the color of IPS Empress 2 ceramic. All specimens with 0.8 mm core and 0.2 mm veneer thicknesses exhibited a detectable color mismatch. Increasing the core thickness to 1.0 mm or the veneer thickness to 0.5 mm reduced the color change.

2. The background type also significantly influenced the color of IPS Empress 2 ceramic. The silver-palladium alloy background produced the lowest ΔE while the resin composite A3.5 background resulted in the greatest color change.

3. All color mismatches were rated as clinically acceptable (ΔE<2). ■■■■

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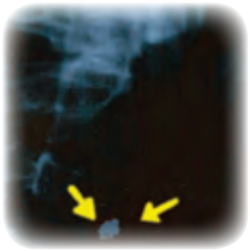

Calcified Carotid Artery Atheromas on Panoramic Radiographs of Dental Patients With Diabetes

MOHAMMAD ALI DOLATABADI, DDS; MOHAMMAD HOSEIN KALANTAR MOTAMEDI, DDS; ESHAGH LASSEMI, DDS; AHMAD REZA TALAEIPOUR, DDS; AND YOUSEF JANBAZ, DDS

ABSTRACT **Background:** Diabetes mellitus accelerates atheromas increasing the risk of a stroke. **Materials and Methods:** Panoramic radiographs of 32 men and 28 women with diabetes mellitus were studied. **Results:** Radiographs showed 28.5 percent type 2 and 37.5 percent type 1 diabetes mellitus patients had atheromas. **Conclusion:** Compared with the 5 percent atheroma rate reported among healthy people, rates were significantly higher in diabetes mellitus patients. **Clinical Implications:** Dentists treating diabetes mellitus patients may encounter atheromatous lesions on panoramic radiographs and refer them for treatment.

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Type 1 diabetes mellitus, known as insulin-dependent diabetes mellitus, is a disorder of beta cell destruction or a defect in beta cell function, usually leading to absolute insulin deficiency. Type 2 diabetes mellitus, known as noninsulin-dependent diabetes or adult-onset diabetes, is a disorder of abnormal metabolism of carbohydrates, fats, and proteins that arises from a combination of resistance to insulin's action and insufficient secretion of additional insulin to compensate for this resistance. The resultant hyperglycemia and other factors associated with the disease may cause premature atherosclerosis of the cervical portion of the carotid artery and markedly increases the incidence of ischemic stroke.[1,2]

Approximately 15 million U.S. adults have type 2 diabetes.[3] Its prevalence increases with age; nearly one in five people in the United States older than 65 years of age have the disorder and have atherogenic risk factors.[4] People with type 1 diabetes mellitus have a severe form of the disease and are managed and treated with insulin (IT group); however, the vast majority of people with type 2 diabetes mellitus have a milder form of the disease managed without insulin (NIT group). The prevalence of calcified carotid artery atheromas seen on panoramic radiographs (OPG) of dental patients with diabetes is an issue of concern for dental practitioners as they may be the first to notice this on an OPG taken for dental treatment.

The authors undertook this study to determine if the prevalence of atheromas varies in patients OPG with type 1 and 2 diabetes and if they have a higher prevalence than that reported in the general population.

Materials and Methods

Records of 60 patients referring for dental treatment who already had panoramic (OPG) radiographs (taken previously for dental treatment) and a history of diabetes mellitus were assessed for atheromas on their OPG. Inclusion criteria for the patients were:

- A diagnosis of diabetes mellitus based on an initial fasting plasma glucose level of 140 milligrams/deciliter or higher, and/or plasma glucose level of 200 mg/dL at two hours after oral glucose challenge, in accordance with criteria established by the National Diabetes Data Group in 1979[5];
- Age of 50 years or older;
- Having an OPG radiograph (for purposes other than this study); and
- Visualizing calcification in the area 2.5 centimeters posterior and 2.5 cm inferior to the cortical rim of the midpoint of the mandibular angle.

The authors divided the study sample into two groups: 28 patients treated without insulin (the NIT group) and 32 patients treated with insulin (the IT group). The authors reviewed the dental and medical records of the NIT and IT groups for factors related to both diabetes and atherosclerosis. Specifically noted were hypertension, body mass index, or BMI (calculated as weight in kilograms divided by the square of the height in meters), with patients categorized as normal (BMI, 18.5-24.9), overweight (BMI, 25-30), or obese (BMI ≥30).[6] Also noted were HbA1c level (percentage of HbA1c, reference range 4.8-5.9 percent).

TABLE 1

Comparisons of Patients With NIT* Diabetes Mellitus and Patients With ITDiabetes Mellitus**

Characteristic	NIT Group (n=28)	IT Group (n=32)	Chi-square Test or *T* Test (P Value)
Prevalence of atheromas on radiographs (%)	28.5	37.5	0.53(.50)
Age in years (mean±SD)^	57±5.5	59.5±4.5	0.50(.60)
Male sex (%)	64.2	68.7	0.13(.50)
Prevalence of hypertension (%)	57.1	53.1	0.20(.50)
BMI^^ (mean±SD)	28.1±4.4	28.9±5.3	0.18(.80)
HbA1c# level (mean±SD)	8.32±1.56	9.12±1.25	0.57(.60)

*NIT: Noninsulin-treated diabetes
**IT: Insulin-treated diabetes
^ SD: Standard deviation
^^BMI: Body mass index
HbA1c: Glycosylated hemoglobin A

TABLE 2

Comparisons of Patients With NIT* Diabetes and Patients With IT Diabetes With Atheromas**

Characteristic	NIT Group (n=8)	IT Group (n=12)	Chi-square Test or *T* Test (P Value)
Age in years (mean±SD)^	56.5±5.5	58.4±2.8	0.46(.80)
Male sex (%)	62.5	58.3	0.03(.50)
Prevalence of hypertension (%)	60	66.6	0.03(.50)
BMI^^ (mean±SD)	27.6±4.1	28.3±6.2	0.12(.80)
HbA1c# level (mean±SD)	8.3±2.2	8.9±2.6	0.24(.80)

*NIT: Noninsulin-treated diabetes
**IT: Insulin-treated diabetes
^ SD: Standard deviation
^^BMI: Body mass index
HbA1c: Glycosylated hemoglobin A

Data analysis used the chi-square test to compare the prevalence rates of atheromas formation and atherogenic risk factors between the NIT and IT groups. Additionally, the authors performed mean comparisons (t tests) to determine which risk factors, if any, distinguished between individuals with diabetes who were treated without or with insulin and those who had or did not have atheroma formation. The first author diagnosed the atheroma, which was later confirmed by the other authors. The study was approved by an ethics committee as this study was retrospective and assessed existing data and radiographs of dental patients.

Results

Comparison of NIT and IT Groups

TABLES 1-3 present general comparisons between the NIT and IT groups. The radiographs showed that 28.5 percent of the NIT patients and 37.5 percent of the IT patients had atheromas; this difference was

not statistically significant (P=0.50). The groups had similar risk factors; that is, high levels of glycosylated hemoglobin A, or HbA1c; hypertension; and obesity (P>.05). When compared with the 5 percent atheroma prevalence rate reported among healthy people of similar age and gender, the rates were significantly higher in both NIT (P=.005) and IT (P=.0005) patients.

Discussion

When compared with the reported 5 percent prevalence rate of radiographically visible atheromas in a nondiabetic control group of similar age and gender range, the

TABLE 3

Comparisons of Patients With and Without Atheromas

Characteristic	A+*(n=20)	A-**(n=40)	Chi-square Test or *T* Test (P Value)
Age in years (mean SD)^	59.2±4.8	58.6±3.9	0.14(.80)
Male sex (%)	60	67.5	0.32(.50)
Prevalence of hypertension (%)	65	57.5	0.31(.50)
BMI ^^ (mean±SD)	28.6±3.2	29.1±4.9	0.11(.80)
HbA1c# level (mean±SD)	8.2±1.7	8.8±1.9	0.33(.80)

*A+: patients with radiographically visible atheroma(s)
** A-: patients without radiographically visible atheroma(s)
^ SD: Standard deviation
^^ BMI: Body mass index
# HbA1c: Glycosilated hemoglobin A

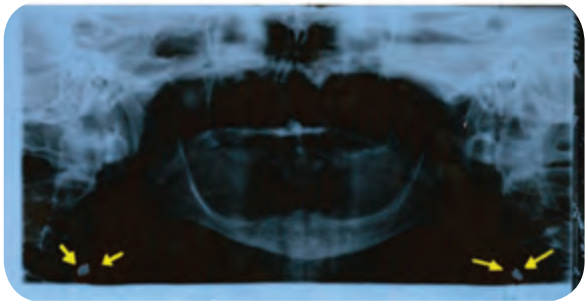

FIGURE 1. A portion of a standard panoramic radiograph that was scanned and digitized to enhance the reader's visualization of an atherosclerotic lesion in the neck (arrows). The patient had type 1 diabetes mellitus and was being treated with insulin.

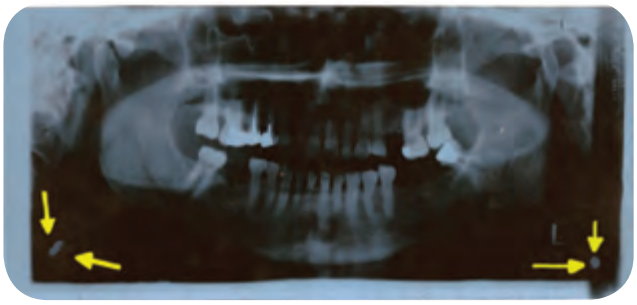

FIGURE 2. A portion of a standard panoramic radiograph that was scanned and digitized to enhance the reader's visualization of an atherosclerotic lesion in the neck (arrows). The patient had type 2 diabetes mellitus and was being treated with oral hypoglycemic agents.

prevalence rates were significantly higher in both the NIT (P=.005) and the IT (P=.0005) patients. The NIT and IT patients with diabetes in this study had similar high prevalence of, hypertension and obesity, as well as similar levels of HbA1c, which may explain the lack of significant differences in atheroma rates between the two groups. The carotid atheromas seen in both populations had a similar morphological appearance (**FIGURES 1 AND 2**). The atheromas varied from single to multiple discrete radiopaque calcifications. They were located within the soft tissues of the neck, 1.5 to 2.5 cm inferior-posterior to the cortical rim of the midpoint of the angle of the mandible. Their appearances and locations differentiated them from anatomical entities (stylomandibular and stylohyoid ligaments, hyoid bone, and epiglottis) and pathological entities (sialoliths, phleboliths, calcified lymph nodes) that may appear in this region.[7]

Diabetes mellitus is a disease complex with both metabolic and vascular components that accelerate the development of atherosclerotic lesions at the bifurcation of the common carotid artery and double or triple the risk of ischemic stroke.[8-14] Type 2 diabetes typically appears after age 40 years and often is associated with the excessive ingestion of a high caloric diet and reduced physical activity, the combination of which results in obesity. Obese people require more insulin (a condition known as hyperinsulinemia) to maintain appropriate blood glucose levels because of a decrease in insulin receptor number and function.[15-16]

The process is magnified in people who have hypertension or who smoke, because both entities damage the endothelium and increase its permeability.[17] The vast majority of the oxidized lipoproteins then are engulfed by the vascular wall macrophages. This process stimulates the macrophage to esterify the lipoproteins, transforming itself into a foam cell. In a mechanism less well-defined, oxidized lipoproteins also are taken up by vascular wall smooth muscle cells that then also undergo transformation into foam cells. This accumulation of foam cells constitutes the major component of the fatty streak that ultimately becomes the atheromatous plaque.[18-19] Calcium salts taken up by the lesion during the maturation process correspond to radiopacities seen on the panoramic radiographs.

Most (85 percent) strokes experienced by people with type 2 diabetes mellitus are of an ischemic nature, and two-thirds of these arise in association with the development of an atherosclerotic lesion in the region of the carotid bifurcation. The hemodynamic force of the blood passing through the atheroma-narrowed lumen disrupts the endothelium overlying the plaque and produces an ulcer that acts as the nidus for a mural thrombus.[20] The thrombus, consisting of platelets, fibrin, and cholesterol, shed emboli that plug the small intracranial arteries that arise from the middle cerebral artery, a direct continuation of the internal carotid artery. Prolonged blockage causes cerebral infarction, the classic manifestations of a completed stroke (long-term or permanent hemiplegia or aphasia) or death.[20]

A dentist treating a patient, noting a suspected atheroma on his or her radiograph, visualizing calcification in the area 2.5 cm posterior and 2.5 cm inferior to the cortical rim of the midpoint of the mandibular angle, should show the patient the lesion as well as its relationship to the course of the common and internal carotid arteries and angle of the mandible. Such a patient also should be informed that these lesions often are markers of generalized atherosclerosis and may be in danger of a future cerebrovascular accident and/or myocardial infarct.[21] Furthermore, the patient should be given a copy of a written consultation directed to his or her primary care physician that describes the radiographic findings, which may suggest obtaining an ultrasound study to confirm the presence and extent of disease.[22]

This protocol is consistent with a dentist's professional responsibilities to diagnose oral manifestations of systemic disease and to counsel patients properly about the importance of arranging for and following through with the consultation as the dentist may be the first to note this disease.[23]

Conclusion

The results of the authors' study demonstrate that OPG may reveal atheromas and that dentists may be in a position to notice and detect carotid atheromas and risk factors associated with

diabetes-induced or accelerated atherosclerosis and stroke during a comprehensive examination of their radiograph. However, in recognition of the study's limited sample size, the authors are now assessing patients for a larger prospective study. The identification of an atheroma on the radiograph of a person with diabetes mellitus mandates that the patient be referred to a physician for confirmation of the presence and extent of atheromatous disease, control of risk factors, and possibly the surgical removal of the carotid atheroma. (Although this was done, the authors did not assess the outcomes or fate of the patients to see if referral affects treatment results as this was not the intent of this study). However, some research shows that these measures reduce the incidence of both fatal and nonfatal ischemic stroke.[24-26] ■■■■

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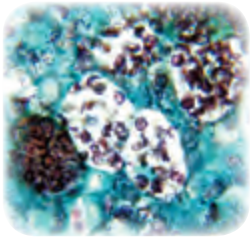

Lingual Ulceration in Disseminated Histoplasmosis

KRUTHIKA S. GUTTAL, MDS; VENKATESH G. NAIKMASUR, MDS; RENUKA J. BATHI, MDS; AND RAVIKALA RAO, MD

ABSTRACT Histoplasmosis is a rare systemic fungal infection commonly presenting as mucosal ulceration of the oral cavity. It has been increasingly reported in India as disseminated disease with lesions in the oral cavity as a consequence of rapid spread of HIV infection. The authors report a case of disseminated histoplasmosis with oral manifestation in a 40-year-old male patient.

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Histoplasmosis is a systemic mycosis commonly caused by inhalation of spores of the fungus *histoplasma capsulatum*. It was first described in Panama and subsequently found to be endemic in the Mississippi and Ohio river basins in the United States.[1] The organism is found in acidic soils and nutrients of bat and bird droppings.[1]

Histoplasmosis is being noted commonly in patients with acquired immune deficiency syndrome. The inhalation of spores by immunocompetent hosts usually results in an asymptomatic or self-limited pulmonary infection whereas in immunocompromised individuals it presents as generalized infection involving multiple organs.[1] The manifestations include fever, weakness, weight loss, hepatosplenomegaly, and mucocutaneous lesions. Less frequently, oral lesions are first and the only sign of the disease occurring in any region of the mouth.[1] Reported here is a case of disseminated histoplasmosis with oral manifestation in an immunocompromised patient.

Case Report

A 40-year-old male patient, a farmer by occupation, reported to the outpatient department of oral medicine and radiology complaining of a wound over the tip of his tongue. It had presented 20 days earlier and had been progressively increasing in size. It was associated with a continuous dull aching type of pain. Previously, the patient had consulted a local physician for the same complaint but treatment efforts were in vain. Also associated was a history of cough and intermittent mild fever, especially in the evenings for the past month. There was history of a significant loss of weight over three to four months. The patient had been smoking since the age of 10.

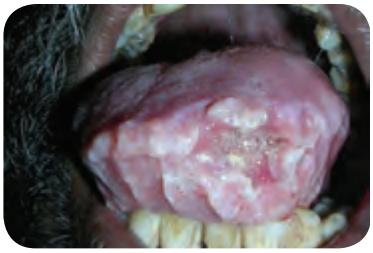
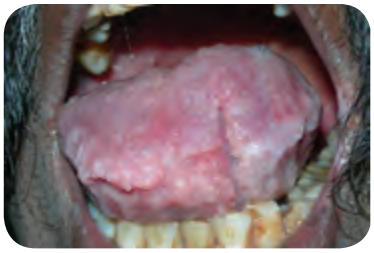


FIGURE 1. Ulcer over the tip of the tongue, with teeth indentations over the adjacent areas.



FIGURES 2. H and E sections reveals sheets of histiocytes distended with small organisms surrounded by a halo.

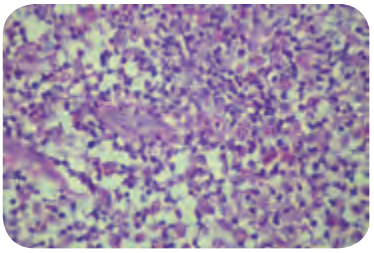


FIGURE 3. Healing ulcer over the tip of the tongue following treatment.

A physical examination revealed him to be moderately built and poorly nourished. There were no clinical signs of anemia or jaundice. But there were multiple enlarged lymph nodes bilaterally in the submandibular region, mobile, firm in consistency and nontender. An oral cavity examination revealed a solitary deep irregular-shaped ulcer measuring about 1 x 1 cm in dimension presenting over the tip, extending over the anterior two-thirds of dorsum of the tongue (**FIGURE 1**). The borders were slightly raised from the surface and firm in consistency, and with indentations of the teeth. The ulcer itself was nontender on palpation. Also noted was poor oral hygiene with most of the teeth being periodontally compromised.

In view of the presenting features of the ulcer, a history of cough, fever, and weight loss, a provisional diagnosis of tuberculous ulcer over the tongue was made. A differential diagnosis of squamous cell carcinoma of the tongue was also considered owing to the adverse habits. But the possibility of deep fungal infection could not be entirely ruled out.

Investigations

Routine hematological tests, including Elisa tests for HIV 1 and 2, was advised as well as a chest X-ray to rule out pulmonary tuberculosis. The hematological reports revealed a normal blood picture with hemoglobin within normal limits, with raised ESR (84 mm/hour). The sample was positive for HIV-1 confirming the immunodeficient status. The CD4 count was 56 cells/mm.^{2} The chest X-ray did not reveal any abnormality.

A histology of the incisional biopsy specimen revealed hyperplastic epithelium with areas of ulceration overlying sheets of histiocytes distended with small organisms (yeast-like bodies) surrounded by a halo. The fungal element was confirmed by periodic-acid Schiff (PAS) staining. There was also dense acute and chronic inflammatory cell infiltration of the stroma (**FIGURE 2**). Macrophages contained small, round to oval organisms with a clear halo. Histopathologic picture and confirmation of fungal elements by PAS staining indicated the diagnosis of a fungal infection possibly oral histoplasmosis. An ultrasound examination of the abdomen to confirm the presence of hepatospleenomegaly proved to be negative.

Final Diagnosis

Owing to the history of a chronic low-grade fever, with cough and lymphadenopathy, the present case can be considered as disseminated form of histoplasmosis with oral ulcer as an extrapulmonary lesion.

Treatment

Initially the patient was treated with 150 mg of fluconazole once daily for duration of one month. The lesion resolved with treatment with fluconozole (**FIGURE 3**). This was followed by antiretroviral therapy with zidovudin 300 mg, lamividine 150 mg, nevirapine 200 mg, all of them as twice daily dosage. The patient failed to follow up following the start of antiretroviral therapy.

Discussion

Histoplasmosis, being responsible for the development of progressive disseminated disease, has been considered to be the most frequently occurring fungal infections in AIDS patients.[3] Clinically, it presents as primary acute pulmonary form, acute disseminated form, chronic pulmonary, and chronic disseminated form (DH).[1]

The first-ever case of oral histoplasmosis in India was reported by Padhye et al.[2] Their review of the Indian literature from 1968 to 1992 concluded that lesions of histoplasmosis in the Indian population tend to occur primarily in extrapulmonary sites, particularly the oral cavity. The various forms of this disease included cutaneous and disseminated lesions.[3-7] West Bengal is considered to be endemic for histoplasmosis in India.

Generally, lesions in the oral cavity are the local manifestation of pulmonary or disseminated disease but rarely may it be the primary or even the only manifestation of the disease.[8] The disseminated form presents as chronic low-grade fever, productive cough, spleenomegaly, hepatomegaly, and lymphadenopathy.[9] The organisms have an affinity for reticuloendothelial system and therefore chiefly concentrate in the spleen, liver, lymph nodes, and bone marrow causing anemia and leucopenia.[8] The occurrence of disseminated histoplasmosis in HIV seropositive patients is less common as compared to that of occurrence in endemic areas.[8]

Furthermore, disseminated histoplasmosis in HIV seropositive patients may not have pathognomonic symptoms and

chest radiographs may show negative results, a feature that was observed in the present case, despite the presence of a chronic cough.[8] The accurate diagnosis requires isolation of the organism from respiratory secretions, blood cultures, bone marrow examination, or a biopsy and culture from other involved sites.[8]

The present case had features of disseminated form like low-grade fever, cough, regional lymohadenopathy, and oral ulceration. But there was no hepatospleenomegaly. The presence of typical granuloma was observed in the tissue from the oral lesion alone. Isolation from other sites was not possible as the patient was noncompliant. Even though the importance of a thorough investigation was explained, the patient expressed his main concern only for the oral lesion, refusing further investigations. A financial constraint was an additional factor deterring any additional investigations to confirm the presence of the organism. The patient had to be referred to a distant National Aids Control Organization antiretroviral treatment center for treatment of an underlying HIV infection and was lost on follow-up.

It can also present as localized ulcerative lesions with indurated borders in the oral cavity. Other features include nodular or vegetative lesions in one or multiple sites with in the oral cavity like tongue, tonsils, faucial pillars, hard and soft palate, and buccal mucosa.[8] The lesions often are secondary and are derived from the blood-borne organism and rarely from the sputum. They occur more frequently in chronic disseminated form. There are reports of primary cutaneous lesions confined locally without any systemic symptoms.[5,9]

Histoplasmosis in a HIV seropositive patient is considered in group III, i.e., lesions possibly associated with HIV infection.

The diagnosis of histoplasmosis relies on clinical features and various investigations. They include a skin test for hypersensitivity to histoplasmin, antibodies to yeast or mycelial antigens, histoplasma capsulatum antigenemia and special stains of histologic specimens and culture. The organism stains well with periodic acid Schiff, giemsa, gomori methanamine silver stains.[8]

Based on the clinical features and other systemic features the list of differential diagnosis may include tuberculosis, traumatic ulcer, squamous cell carcinoma, acute necrotising gingivostomatitis, sarcoidosis, and lymphoid malignancy-like Hodgkin's lymphoma.

THE OCCURRENCE of disseminated histoplasmosis in HIV seropositive patients is less common as compared to that of occurrence in endemic areas.

Treatment options for the condition include use of ketoconazole, itraconazole, fluconazole, or amphotericin B, and further antiretroviral therapy is required.[9]

Conclusion

Histoplasmosis may rarely manifest in immunocompetent patients. It should be included in the differential diagnosis of deep oral ulcers, especially in immunodeficient states like HIV seropositive patients. A thorough examination of suspicious oral lesions is essential as it may be the only sign of AIDS development. Furthermore, the oral lesions are important not only in early diagnosis of the disease but also in monitoring the progress to AIDS. ■■■■

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- **DIXON:** *For Sale*-General Dentistry Practice. '08 collections were $122,894. 3-op, 1,100 sq. ft. office. Owner has relocated out of state and is motivated. Good opportunity to build a practice in a growing community near Davis, CA. #14265 SALE PENDING
- **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 SOLD
- **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 35 years. 3 TX 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. SOLD
- **FRESNO:** *For Sale*-**Office Space Only in North Fresno Area.** New fully equipped 3-op dental space avail. asking $115K. Equip. approx. 2 years old. Space avail. for 4th op. Office design contemporary & tastefully done. Asking price includes all leasehold improvements. SOLD
- **GRASS VALLEY:** *For Sale*-This Periodontal Practice is located in a very desirable growing community. Practice has been in its present location for the past 28 years. Office consists of 1500 sq ft 3 ops, Intral -oral camera. Practice has 5 days of hygiene.
- **GREATER AUBURN AREA:** *For Sale*-General Dentistry Practice 7 Dental Building, Outstanding opportunity to purchase well established, very successful, 4 op Fee for Service practice. 1,800 sq. ft. dental bldg. in the Sierra Foothills. No PPO or HMO. '08 Collections $763K on 3.5 days with 5.5 days of hygiene. Owner is retiring. #14304
- **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. 12 Treatment rooms, Pano, Laser, Intra Oral Camera,10-years in same location. Three days of hygiene. Owner-32 years in practice willing to work a couple days of week to help transition the practice or as Role-Reversal.
- **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
- **OROVILLE:** *For Sale* - General Dentistry Practice. Owner dentist recently deceased. 2009 collections $770K. Very nice stand alone dental building with basement. 7 ops digital x-ray 5 days of hygiene. Bldg 3,000 sq ft Basement 540 sq ft. Temporary Dentist in place. SOLD
- **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.
- **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. SALE PENDING
- **PORTERVILLE:** *For Sale*-One of two partners is retiring in this highly successful General Dentistry Practice. Receipts $2Mil. adj. net $1,257,000. 2,000 sq ft 6 ops. Intra-Oral camera, Pano, Dentrix.10 days of hygiene. #14291
- **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
- **RED BLUFF:** *For Sale*-General Dental Practice **"REDUCED PRICE"** Facility overlooks the Sacramento River, 3,500 sq ft, has 8 ops, 10 hygiene days. Reduced price/Or Best Offer due to retiring doctor's health. Historically Gross Receipts have been over $1Mil per year. 100% financing available. Sale of Building (optional) #14252
- **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 $763K with adj. net of $263K w/65% overhead. Bldg. also for sale. Owner deceased. SOLD
- **ROSEVILLE:** *For Sale*-General Dentistry Practice. 2008 Receipts $834K with adjusted net income of $297,218. 64.4% overhead. Practice has been in this present location for the past 7 years. 15-18 New Patients a month. 6-treatment rooms in 2,100 sq ft. Laser, Intra-oral camera, and digital radiography.Owner relocating out of office. SOLD
- **SAN FRANCISCO:** Financial District 4 ops, 1,500 sq. ft. MERGER - Buyer needed to bring in Pt. base #14288 SOLD
- **SAN FRANCISCO: Deceased Dentist.** General Dentistry Practice for Sale. Fee for Service GP Practice on busy street in lower Mission District. 2008 collections were $496,600. 4 ops. with Pano. in 1,100 sq. ft. office. Practice in same location for 41 years. Hygiene 3 days a week. Refers out Endo, Perio, Ortho, Oral Surgery. Great opportunity for exp. Dentist. Owner Dentist is recently deceased. Temporary Dentist working practice until sale. #14299 SOLD
- **SOUTH LAKE TAHOE:** *For Sale*-General Dentistry Practice.Office is 647 sq ft, with 3 ops. Practice has been in its present location for the past 26 years. Owner to retire. #14277 SOLD
- **YUBA CITY/ MARYSVILLE:** *For Sale*-General Dentistry Practice w/Bldg avail. Practice located in present (great) location over 30 years. 1,800 sq ft 5 ops 4 hygiene days. Owner to retire.#14273 SOLD

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Featured Listings

ORANGE COUNTY COASTAL COMMUNITY - (Perio) ***New Listing!***
Busy periodontal practice with a highly desirable location. 5 op, very profitable business with long term goodwill and a great staff. 2009 collections $900,000+. The seller is retiring.

LANCASTER - ***New Listing!***
Long established, 4 op GP with an excellent location in a professional complex. Strong patient base developed over 34 years. 2009 collections exceeded $670,000. The seller is retiring.

LOS ANGELES (Endo)
4 op, long established endodontic practice. Located in an easily accessible professional building next to a major intersection

INLAND ORANGE COUNTY
Newer, three operatory GP start-up opportunity. Located in a shopping mall, the practice is currently open only two days per week and is positioned for growth.

CHINO - ***Price Reduction!***
4 op GP located in a dental complex. Stand alone building. 2009 collections $368,000+.

SOLANO COUNTY ***Price Reduction!***
4 op (3 equipped) GP with strong patient base. Efficient facility and proven systems.

SAN JOAQUIN COUNTY (Pedo)
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.

SACRAMENTO COUNTY (Ortho)
Spacious 6 op (4 equipped) well established orthodontic practice in a full service office building easily accessible from a main street. 2009 collections $440,000+.

MORENO VALLEY
Spacious, 2,700 sq ft, 7 op (6 equipped), GP with a busy location, 25 years goodwill, strong patient base & plenty of room for growth. 2008 collections $446,000+. Seller is relocating.

Pending

NORTH SAN DIEGO COUNTY
Well established 5 op GP with 14 years of goodwill and room for growth. The selling dentist is highly motivated and all reasonable offers will be considered.

VENTURA COUNTY
Long established 3 op GP with a convenient strip mall location. Well trained staff. Collections are consistently growing with 2009 gross $431,000+.

Pending

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PRACTICE SALES AND LEASING

Paul Maimone Broker/Owner

VISIT US @ THE CDA IN ANAHEIM MAY 14-16, 2010 BOOTH # 654

ANAHEIM – (3) op computerized G.P. Low overhead office. Cash/Ins/PPO/Denti-Cal patient base. Annual Gross Collect. $260K+ p.t. Will do more f.t. Seller motivated.
ARCADIA – (4) op computerized G.P. Cash/Ins/PPO only. Gross Collect $315K+/yr on a (4) day week. In a well known, easily accessible medical/dental bldg on a main blvd. **PENDING**
BAKERSFIELD #20 – (3) op G.P. & bldg. 2 eqt'd/3rd plumbed. Gross $450K+. **SOLD**
BALDWIN PARK #2 – (5) op G.P. (4) eqt'd. Strip Ctr. Mixed pts. Gross $210K p.t.
CALABASAS – "Build to Suit" Dental space avail for long term lease. 1,200 – 3,600 sq ft **NEW**
CULVER CITY – (3) op comp G.P. Cash/Ins/PPO/minimal amt Denti-Cal. $425K+/yr.
FRESNO – (3) op G.P. (4) yr old eqt. Mixed patients. 2009 Collections $220K+ p.t. **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.
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**
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**
VALLEY VILLAGE (SHERMAN OAKS) – (4) op computerized G.P. 2009 Collections $477K. Cash/Ins/PPO pts. Seller is 1-800-DENTIST. In a free stand. bldg. w visibility. **NEW**
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!**
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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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.

OPPORTUNITY AVAILABLE — Seeking experienced dentist to lease or buy 50% of fee-for-service practice. We have been open for four years and now have excess patient base to treat. We are in a highly affluent area near Sacramento. Practicing doctor works 20 hours a week. Does full mouth cases including implant placement and is willing to train. Excellent opportunity for the right candidate. Fax resume to 916-939-6637.

SEEKING GENERAL DENTIST — Scripps Center for Dental Care, La Jolla seeks a GPR graduate with minimum five years post training clinical experience for 3-4 days per week. High quality, multi-specialty, fee-for-service office located on Scripps Memorial Hospital Campus in XIMED Medical building. Our reputation of excellent care, exceptional equipment and unique location combine for a great opportunity. Please fax resume and cover letter to 858-535-8309.

CONTINUES ON 206

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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 comprehensi[SOLD]horough care by well-trained [SOLD]ed staff. Located in 2,100 sq [SOLD] 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-[SOLD] 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

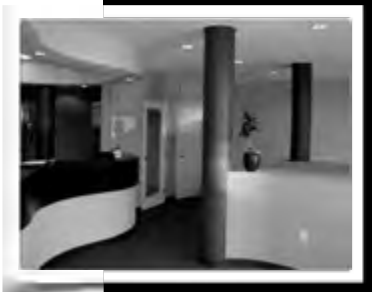
Seller retiring fr[SOLD]n his long established general [SOLD],400 sq. ft. fac. with 3 fully e[SOLD]ops. Located in desirable neighborhood close to down town area. 2008 GR $322K+ with a 4 day doctor work week. Asking $194K.

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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BAY AREA

A-6781 SAN FRANCISCO - 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 Now!***

NEW! **A-807 SAN FRANCISCO** - Well-known Medical/Dental Prof bldg in heart of downtown financial district. Quality, state-of-the-art practice. 800sf w/2 fully equipped ops. Plumbed for 1 add'l **$250k**

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. **ONLY $49k**

B-7881 TRI VALLEY, CA - ***Facility Only*** - Location, Location, Location! 1070 sf, 4ops, ADEC chairs and equipment. Fully networked Dentrix computers. **$325k**

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

NEW! **B-8531 W. Contra Costa** - Just blocks off I-80 commuter corridor. Multi-story Dental Prof Bldg. 1,212sf w/3 fully equipped ops. **$475k**

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

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

BAY AREA CONTINUED

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-820 VALLEJO- Strong, loyal patient base growing by word-of-mouth referrals. 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-779 SUNNYVALE - Well established GP in heart of Silicon Valley! 4 ops, 1050sf. Call for more information! **$225k**

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 ops, **$1.2m**

NEW! **D-845 SAN JOSE** - ***Facility*** - Attractive office. Traditional décor. Retail Plaza. 2,240 sf & 5 ops. **$150k**

NEW! **D-8521 SAN MATEO-Facililty** - SPECTACULAR office -Quality dental care - Modern facility. Just blocks off of Hwy. 92 and I-280. 2-Story Shp Plza. 2,076 sf & 4 ops + 3 add'l **$150k**

NEW! **D-8541 SANTA CRUZ**-Relaxed atmosphere. Well-established, modern practice. Free standing single story building. Affluent, desirable location. 1,650sf & 4 ops. Plumbed for 1 add'l. **$430k**

NEW! **D-857 MOUNTAIN VIEW**- Quality practice. Busy traffic flow. Significant walk-in patients-continuous growth. Free-standing bldg w/ ample exclusive patient parking. 3,400sf - 11 ops **$595k**

NORTHERN CALIFORNIA

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**

E-7121 SACRAMENTO AREA – Largely FFS. 1800sf, 4ops (+2 add'l plumbed). Highly visible,2-story Prof bldg. **$695k**

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**

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

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NO. CALIFORNIA CONTINUED

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**

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-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 **$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**

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**

SOUTHERN CALIFORNIA CONT

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**

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-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-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. **$325k**

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**

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

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6. What kinds of things should a Buyer consider when evaluating a practice?
7. What are the tax consequences for the Buyer when purchasing a practice?

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ADVERTISER INDEX

CDA JOURNAL, VOL 38, Nº3

DR. BOB, CONTINUED FROM 210

aware of two morgue attendants standing expectantly in the background beside their gurney when I hear a female voice announce, "Robert, you may come in now."

I try to respond in kind by attempting to read her name tag pinned to her blouse just south of her left clavicle, but realize that staring any longer to make out the words would not be in my best interests. Laying aside the article I had been reading in *Woman's Day* on how to cope with those pesky postpartum stretch marks, I trail after the paisley-topped assistant into the inner sanctum. Young enough to be my granddaughter, she is preternaturally cheerful as she confides that we will pause for a moment to weigh me.

At the end of the hall is the scale, impossible to circumvent. The drill is always the same and her buoyancy is ill-suited for the occasion.

"Hop on," she trills cheerfully. Every time I have ever mounted one of these doctor scales it is obvious the patient before me could not have weighed more than 110 pounds. There follows a deliberate, prolonged humiliation during which the weights are slowly advanced along their tracks almost to the end before balance is achieved.

"My shoes weigh at least five pounds each, you know," I always offer, feeling this should be taken into account as a truer indication of my poundage. I could be wearing a full-length raccoon coat, pockets loaded with enough lead weights to anchor the QE2 and the results would be carefully recorded in my chart. Technically, one should be weighed in the buff. If nothing else, the procedure would add interest to an otherwise dull day at the office.

If an inaccuracy of this magnitude is tolerated, the requisite recording of my vitals that follows is subject to plus or minus 35 percent errors and are meaningless except to satisfy blank places on the chart.

Technically, one should be weighed in the buff. If nothing else, the procedure would add interest to an otherwise dull day at the office.

It seems under-the-tongue thermometers are an anachronism. A hand-held electronic probe is inserted three inches into my ear, beeps once and immediately withdrawn. I assume this is a rejection because of the wax buildup, but Paisley dutifully notes the 98.6 on my chart and takes my blood pressure.

Blood pressure taken in an examination room automatically initiates the white coat syndrome and elevates itself to near fatal limits. I also believe if I hold my breath, close my eyes and roll my eyeballs upward in their sockets, then focus on arbitrary numbers like 120 and 75, I can achieve any reading I please commensurate with my age. Or better yet, some kid about 25 who has matured in every way except for calling everybody "Dude!" and wearing a baseball cap incorrectly.

Paisley smiles benignly at me. Were the room to be suddenly bathed in ultraviolet light, a little "thought bubble" would appear over her head containing the words "What a porker!" In any event, Paisley is satisfied with my BP, thinking, not bad for a geezer with one foot in.

She departs to fetch the doctor, taking my 2-inch thick folder with her lest I sneak a peak at my own records that I couldn't read anyway, written as they are in Physicianese!

Modern medicine has streamlined the whole medical appointment experience to the point where the doctor is the last person encountered. When I was younger, the next step would be the entrance of the doctor, an older man radiating compassion and wisdom, sort of like my grandfather, only richer.

In time (this is Doctor Time, different from Patient Time), the doctor breezes in. A substantial part of my wardrobe is older than he. He gets right to the point, the meter is running. "What's the matter with your knee?" he asks. Well, duh! At $10 I have to do my own diagnosis?

"It hurts when I do this" I explain, flexing my left leg gingerly.

"Then don't do that." His eyes grow pensive. "How long?"

"Six weeks." He palpates the joint in a doctorly manner. "A stretched ligament or tendon," he says, conserving unnecessary words as if texting me. "Nothing to worry about. Take a while to disappear. Couple of Advil or Aleve are OK."

"But, I …" It is too late. Obviously, administering extreme unction to my knee is premature and the problem is too intricate and inconsequential to warrant recapitulating.

"You need a flu shot and a pneumonia shot," he states. "Take this form to the lab. See you in two weeks."

He's out the door and I am left sitting on the crinkly paper-covered table, as my list of assorted ailments flutters to the floor. Left knee, CHECK.

What a nice man! Not once did he mention the fact that at my age it would be unrealistic to expect anything less than yard-long grocery list of physical woes. Maybe I'll come back next fall after a summer of reckless hedonism. I should have a list to reckon with by then. ■■■■

CDA JOURNAL, VOL 38, Nº3

Aging Gracefully (and Other Indignities)

My knees, unlike some of my other body parts, had not communicated with me for more than eight decades.

Robert E. Horseman, DDS

ILLUSTRATION BY DAN HUBIG

When I pay one of my infrequent visits to my primary care guy, I make certain to get my $10 co-payment's worth by saving up symptoms until I'm sure I have enough to command his attention for at least 10 minutes. These are carefully recorded on a list I bring with me.

My left knee has begun to hurt. My knees, unlike some of my other body parts, had not communicated with me for more than eight decades. I compared the ailing knee with its mate. Although they are both the same age and appear to be dimpled twins, the complainant had taken on a life of its own, either refusing to bend comfortably or threatening to flex both ways without advance warning.

After six weeks of ignoring it, I finally managed to accumulate a qualifying number of unrelated complaints, including a twinge in my right shoulder and two suspicious spots on my right forearm at least 4 microns in width. In addition, an annoying extra trip to the bathroom around 4:30 a.m. convinced me that at least one or two of these symptoms confirm the presence of a fatal disease requiring surgical intervention immediately. Time to shell out the $10 co-pay.

My instinctive distrust of general anesthesia was intensified by the probability of the operating surgeon assigned to save my life being revealed as a head case on the verge of going postal from stress and fatigue. "You need to make an appointment," I told myself. I did — the following spring.

An overhead wide-angle shot of a surgical amphitheater overflowing with students and resident doctors form clearly in my mind. Gathered from as far away as Rochester, the assemblage leans forward in hushed reverence to witness my surgeon's legendary expertise. I had just become

CONTINUES ON 209

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