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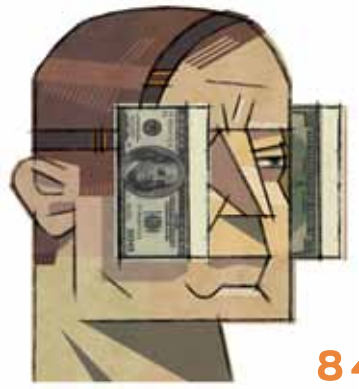

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Crystan Ritter
ADMINISTRATIVE ASSISTANT
Crystan.Ritter@cda.org
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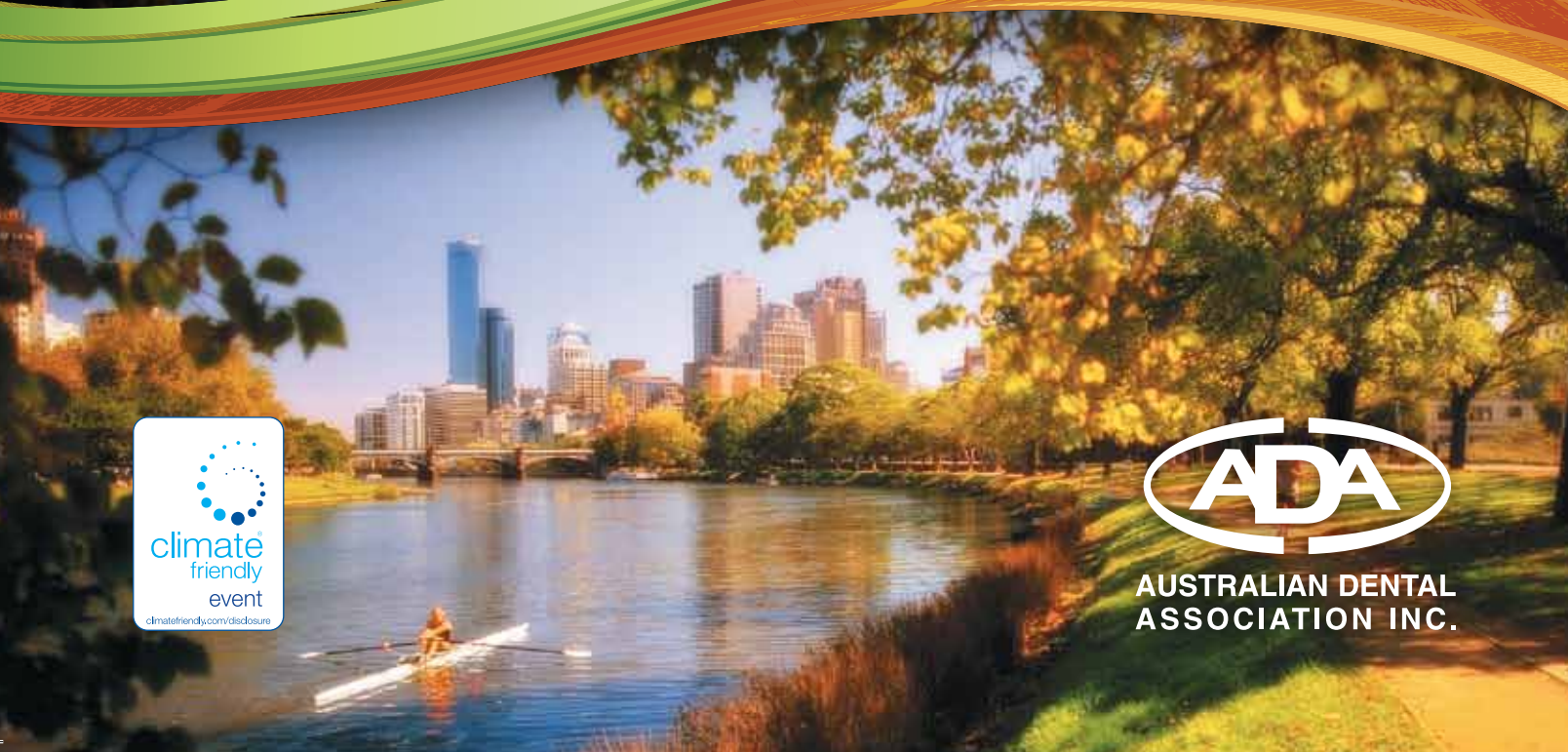

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CDA JOURNAL, VOL 40, Nº11

Life in a DHPSA

BRIAN SHUE, DDS, CDE

One can easily imagine such an area. Desolate. Remote. Practically uninhabitable. Just like Imperial County. Life in the typical DHPSA.

Life is full of extremes.

Take Imperial County. Located in the south-easternmost region of California, it is part of the Sonoran Desert that shares borders with Arizona, Mexico, and the San Andreas fault. Temperatures blister at 110 degrees-plus during the summer. An 18th century Spanish explorer traveled through the region, lived to tell about it, and said this was the most uninhabitable place he had ever seen.

During World War II, U.S. Gen. George S. Patton trained his armored corps here to prepare for battle in North Africa. Today, the U.S. Marines use the area as a training ground because the conditions are similar to the deserts of the Middle East. The U.S. Navy regularly drops live bombs for target practice, heavily shaking the region.

Hollywood also discovered Imperial County's desolation. George Clooney, Jake Gyllenhaal, Val Kilmer, and others have filmed desert movies — what else? — here. Most prominently, George Lucas came here for *Star Wars: Episode VI* and filmed (spoiler alert) a bikini-clad Princess Leia in chains giving desert-creature Jabba the Hut his comeuppance.

Paradoxically, this arid region is one of the United States' most productive farmlands, made possible with a century-old decision by the U.S. Supreme Court to give parched Imperial County 70 percent of Southern California's entire Colorado River water allotment.

People live here, according to the 2010 U.S. Census. However, Imperial County has the highest unemployment rate in the United States, often hovering at 30 percent. For example, 1,000 applicants appeared for job interviews at the new In-N-Out Burger restaurant. It is no surprise that a recent attention-getting Internet blog ranked this area including the central city of El Centro as the No. 1 worst place to live in the United States, even worse than Cleveland or Detroit. And Cher was born here.

Imperial County has dentists, too. But not enough, according to the Health Resources and Services Administration (HRSA) agency of the U.S. Department of Health and Human Services. HRSA designates Health Professional Shortage Areas as "having a shortage of primary medical care, dental, or mental health providers." One can easily imagine such an area. Desolate. Remote. Practically uninhabitable. Just like Imperial County. Life in the typical DHPSA. But not quite.

Sure, Imperial County easily fits the mold. As of July 11, Imperial County has three dental HPSAs. But the middle-of-nowhere perception of the typical DHPSA doesn't paint the whole picture. HRSA states a HPSA can be urban, too.

Travel to the other side of the San Andreas in California and you will find three DHPSAs in the city where Tony Bennett left an organ. That's right. San Francisco — the city with the highest ratio of practicing dentists-to-population in California — has dentist shortage areas. This isn't an anomaly, as 39 percent of DHPSAs in the United States are in metropolitan regions. As of July 2012, 1,706 out of 4,389 DHPSAs across the country were classified as urban.

San Francisco has 1762.3 full-time equivalent (FTE) dentists for its 805,235 residents, or one dentist for every 457 people. In comparison, Imperial County has 37.3 FTE dentists for the whole county of 174,528 people, which is one dentist for every 4,684 people. California's dentist-to-population average is 1:1,440 and the national ratio clocks in at 1:1,660.

The Office of Shortage Designation, Bureau of Health Professions of HRSA reports that 43,820,106 people in the United States live in DHPSAs — 1,509,342 of those reside in California. But since not all the people who live in a DHPSA actually experience barriers to dental care, the total estimated underserved population in DHPSAs is 29,728,245 in the United States and 963,189 in California.

HPSAs are determined by provider-to-population ratio, rates of poverty, and access to primary health. Imperial County's median household income is $35,085 and an estimated 17.6 percent live below the U.S. Federal Poverty Level. San Francisco's median household income is $57,476 and an estimated 10.8 percent live below the USFPL.

A dental HPSA belongs to one of three categories: geographic area, population group, or facility. For a geographic area, the dentist-to-population ratio is at least 1:5,000, or greater than 1:4,000 with "unusually" high needs for dental care, or barriers exist in accessing dental care. For a population group, access barriers exist for a certain group and ratio of 1:4,000 or greater is present, or members of federally recognized Native Americans. Finally, a facilities category is given to certain correctional institutions or public and/or nonprofit medical/dental facilities caring for a geographic area or group, or insufficient capacity to provide care.[1]

In order to reach the ideal HPSA dentist-to-citizen goal of 1:3000, California's 289 dental HPSAs need 283 more FTE dentists and the United States'

Dental HPSAs need 8,811 more dentists. HRSA counts these dentists as follows: "All nonfederal dentists providing patient care ... except in those areas where it is shown that specialists (those dentists not in general practice or pedodontics) are serving a larger area and are not addressing the general dental care needs of the area."

Removing barriers to care in California's DHPSAs will continue to depend on finding innovative ways to increase the number of dentists that locate there. The most successful has been the loan repayment program. By committing to work at a clinic located in a DHPSA, $30,000 to $35,000 of a dentist's student loans is repaid for each year of service. There are four different loan repayment programs in our state. The National Health Service Corps, a branch of HRSA, offers the state and federal loan repayment programs. Currently, there are more than 10,000 NHSC dentists, physicians, and other clinicians working in underserved areas across the United States. These programs require a minimum of two years of service and with a longer stay, "providers may be able to pay off all of their student loans."

CDA Foundation also has had a successful track record with its student loan repayment program with $105,000 given for a three-year service commitment. The newly selected recipient usually speaks at the CDA House of Delegates about his/her impact on our communities, which is always a highlight. The fourth type is the California state loan repayment program, which is administered through the Dental Board of California. Additionally, the 2011 ADA House of Delegates ratified Resolution 91: Student Loan Reduction Program, in order to lay the groundwork for a possible ADA-funded loan repayment program. Our 13th District California delegation cosponsored this resolution, which will be brought for final consideration in 2012.

Finally, it is interesting to note that most of the dentally underserved population live outside of designated shortage areas. After all, many experience barriers to dental care, whether they live inside or outside of a DHPSA, whether in the middle of a metropolis or in a desert.

Or even in Cher's birthplace. ■■■■

REFERENCE

1. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/dentalhpsaoverview.html.

The End of the World

I enjoyed Dr. Carney's June editorial, "The End of the World ... or Not." She talked about the predictions in the Mayan calendar that the world is going to come to an end on Dec. 21, 2012.

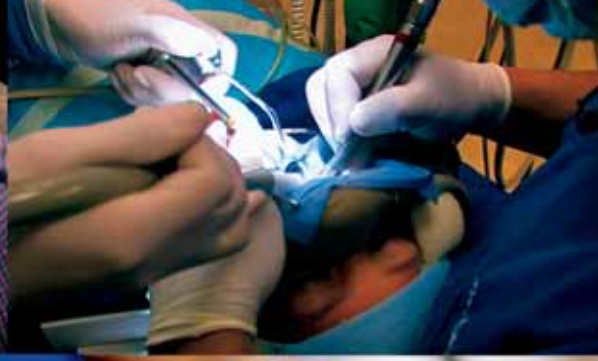
It got me thinking of how I could help so many people to realize the smile of their dreams before meeting their maker on this long-predicted day. From now until the end, I could offer all cosmetic procedures with no money down. People who have been putting off getting this work done due to lack of time will realize that time is about to run out. They will not want to go out without first achieving that beautiful smile they had always wanted. All they will have to do is write a post-dated check for Dec. 22, 2012, for the amount of the work to be done. This will be a win-win for both of us. On the fateful day of Dec. 21, they will have achieved their dental goals; and I will be looked upon more favorably for all the pro-bono work I have done in my final days. If, for some reason, the end doesn't come, well maybe I'll go buy a new car.

GERALD M. MIDDLETON, DDS
Riverside, Calif.

The *Journal of the California Dental Association* welcomes letters.

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





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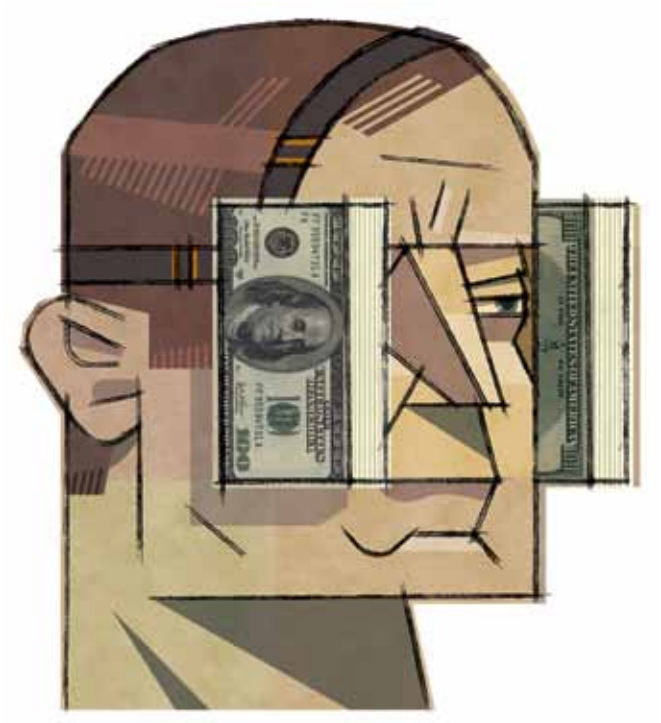


Moral Bleaching

DAVID W. CHAMBERS, PHD

"Out, damn spot! Out, I say." Lady Macbeth, mentally deranged by the final act of William Shakespeare's play *The Tragedy of Macbeth*, cannot scrub her hands clean of the imagined blood of King Duncan, whom she and her husband have offed. What she needs is moral bleach.

The term — or its equivalent, ethical fading — has a technical meaning in philosophy. It refers to moving a moral violation sideways into the legal context and then buying one's way out. Consent decrees are a classical example. Businesses that engage in morally repugnant practices agree to settlements for monetary compensation without admitting guilt. That accomplishes two objectives: The costs of litigation are reduced; and, in most cases, the record of the past action is expunged and may not be used as evidence in future trials. But the great pay-

CONTINUES ON 850

Correction

Lisa Okamoto, RDH, was misidentified as a dental assistant in captions accompanying the information on winners of the annual Table Clinic Competition at *CDA Presents* in Anaheim (September 2012, Pages 714–718).

CDA regrets the error and apologizes to Ms. Okamoto, who was, in fact, president of the California Dental Hygienists' Association at the time the Table Clinics were held. CDA and CDHA have developed a very positive and collaborative relationship due in part to Ms. Okamoto's leadership, and CDA wishes to acknowledge that relationship and express its gratitude to her for our ongoing partnership.

The captions have been corrected in the online version of the September issue.

Arthritis Patients May Be at Higher Risk for Gum Disease

Results of a study suggesting the risk for gum disease is higher for people with rheumatoid arthritis was recently published online in the journal *Annals of the Rheumatic Diseases*.

The goal of the small study was "to find the strength of association between periodontal disease and rheumatoid arthritis (RA) in nonsmoking, disease-modifying antirheumatic drug naive RA patients in a case-control design," the authors wrote.

The researchers compared 91 adults with RA to 93 health control subjects. All study participants were nonsmokers, since smoking is a known risk factor for RA, and had not been treated with arthritis drugs. Demographic data and disease-specific variables were recorded for both groups, the authors reported.

Disease activity was quantified using a specific score and by measuring levels of inflammatory markers. Nearly 65 percent of patients with RA had evidence of gum disease, compared with 28 percent of their healthy peers.

"[Gum disease] is more common and severe in rheumatoid arthritis patients than in healthy controls ... and could be a potential environmental trigger in the [development] and also in the maintenance of systemic inflammation in [the disease]," the study authors concluded.

Although the study found an association between RA and the prevalence of gum disease, it did not prove a cause-and-effect relationship.

Source: *Annals of the Rheumatic Diseases*, 71(9):1541–4.

CDA JOURNAL, VOL 40, Nº11

"Our findings show that medications are indeed effective in increasing smokers' chances of quitting when used in the real world."

KARIN KASZA, MA

Chances of Quitting Smoking Increase With Medications

New research published in the British journal *Addiction* shows that smokers who are trying to quit are more likely to be successful if they use FDA-approved stop-smoking medications.

Researchers at Roswell Park Cancer Institute conducted the study by tracking smoking behaviors of more than 2,500 adult smokers in the United Kingdom, Canada, Australia, and the United States who reported making an attempt to quit from 2006 to 2009.

Authors asked participants of the study how long ago they had attempted to quit and whether any type of cessation medication was used during the attempt. The next follow-up interview measured six-month continuous abstinence among those who had reported making a very recent attempt to quit.

The results showed that participants who had used varenicline, bupropion, or the nicotine patch had much higher quit success at six months compared with those who tried to quit without using medication.

"By restricting our analyses to those who made very recent quit attempts, we reduced the extent to which differences in quit-attempt recall could bias the estimates of medication effectiveness. Consistent with the strong evidence from clinical trials, our findings show that medications are indeed effective in increasing smokers' chances of quitting when used in the real world," said lead author of the study Karin Kasza, MA.

"The major advance of this study is that we have been able to show that greater forgetting of unassisted failed attempts is the most likely reason other studies have not found a benefit for medication in population-based settings. This finding should reassure clinicians and public health workers to continue to encourage the widespread use of medications," added Ron Borland, PhD, co-author of the study.

Ad Council, Dental Coalition Launch Nationwide Oral Health Literacy Campaign

Kids' Healthy Mouths — a public service campaign designed to teach parents, caregivers, and children about the importance of oral health — recently kicked off nationwide.

The California Dental Association and 35 other dental organizations formed the Partnership for Healthy Mouths, Healthy Lives and collaborated with the nationally recognized Ad Council to produce a three-year advertising campaign aimed at raising awareness about the value of good oral health for children.

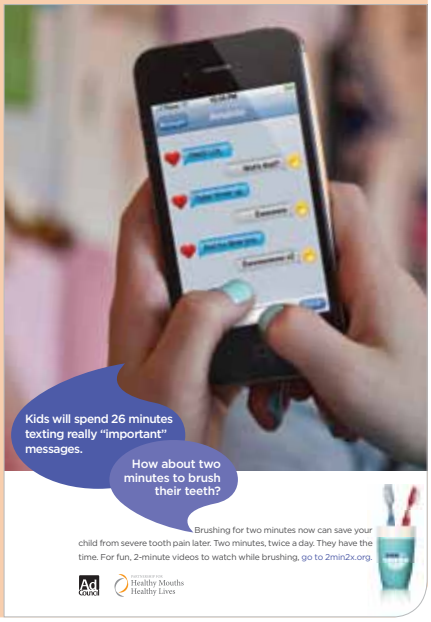
The primary message of the Kids' Healthy Mouths campaign is to encourage children to brush their teeth "2min2x," two minutes, twice a day. Public service ads poke fun at myriad silly things children will spend their time doing and highlight that it only takes two minutes, twice a day to prevent tooth pain.

The campaign's initial phase will focus on parents and caregivers of children ages 12 and younger to motivate them to protect kids from dental disease and pain. After the initial phase, four basic elements of oral health will be introduced — brushing with a fluoride toothpaste, flossing, good nutrition, and seeing a dentist on a regular basis.

The campaign includes extensive media and public relations outreach, communication in both English and Spanish, videos and online tools to support basic preventive care, and encouragement to visit the dentist.

The Ad Council is known for such iconic public service advertising campaigns as McGruff the Crime Dog's "Take a Bite out of Crime" and the United Negro College Fund's "A Mind Is a Terrible Thing to Waste."

To learn more about the campaign and to watch the videos, visit 2min2x.org.



Blood Pressure Meds Linked to Lip Cancer Risk

According to a recent study in *Archives of Internal Medicine*, the risk for lip cancer increases with long-term use of photosensitizing antihypertensive drugs.

A team of researchers from Kaiser Permanente Medical Care Program and Stanford University School of Medicine evaluated prescriptions dispensed and cancer occurrence from Aug. 1, 1994, to Feb. 29, 2008. The researchers identified 712 patients with lip cancer (cases) and 22,904 comparison individuals (controls) matched for age, sex, and cohort year of entry in the susceptible group, non-Hispanic whites.

In a previous study, researchers noted an association between lip cancer risk and the photosensitizing antihypertensive drugs hydrochlorothiazide and nifedipine.

"In this study, we further characterized the risk of lip cancer associated with these and other commonly used antihypertensive drugs," the authors wrote.

The researchers found that compared with no use, a five-year minimum supply of a drug presented the following odds ratio, respectively: hydrochlorothiazide, 4.22; hydrochlorothiazide-triamterene, 2.82; lisinopril, 1.42; nifedipine, 2.50; and atenolol, 1.93. In contrast, the researchers reported a reduced risk of developing lip cancer for patients treated with atenolol for five years or more, with an odds ratio of 0.54.

"These data support an increased risk of lip cancer in non-Hispanic whites receiving treatment for hypertension with long-term use of photosensitizing drugs," the authors concluded.

Source: *Archives of Internal Medicine* 172(16):1246–51, 2012.

Antibacterial Chemical in Toothpaste May Impair Muscle Function

Results of a recent study show triclosan — an antibacterial chemical commonly used in personal care products such as toothpaste, mouthwash, and hand soaps — hinders muscle contractions at a cellular level.

The study — by researchers at the University of California, Davis, and the University of Colorado — measured the effects of triclosan on muscle activity, using doses similar to those that humans and animals may be exposed to during everyday life.

The research team used in vitro experiments to measure the effects of triclosan on molecular channels in muscle cells that control the flow of calcium ions, creating muscle contractions. They found that the chemical impaired the ability of isolated heart muscle cells and skeletal muscle fibers to contract, explaining that normally electrical stimulation of isolated muscle fibers under experimental conditions evokes a muscle contraction, a phenomenon known as "excitation-contraction coupling." However, researchers found that in the presence of triclosan, the normal communication between two proteins that function as calcium channels was impaired, causing skeletal and cardiac muscle failure.

The authors also found that triclosan impairs heart and skeletal muscle contractility in living animals; anesthetized mice had up to a 25 percent reduction in heart function measures within 20 minutes of exposure to the chemical, according to the study.

In addition, the mice had an 18 percent reduction in grip strength for up to 60 minutes after being given a single dose of triclosan.

"The effects of triclosan on cardiac function were really dramatic," said study co-author Nipavan Chiamvimonvat, MD. "Although triclosan is not regulated as a drug, this compound acts like a potent cardiac depressant in our models."

Triclosan was developed to prevent bacterial infections in hospitals, but it has become a common ingredient in antibacterial household products. However, according to the U.S. Food and Drug Administration, other than its use in some toothpastes to prevent gingivitis, there is no evidence that triclosan provides other health benefits or that antibacterial soaps and body washes are more effective than regular soap and water.

The study was published online in the Proceedings of the *National Academy of Sciences of the United States of America*.

Source: ucdmc.ucdavis.edu/publish/news/newsroom/6872.

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"Our goal is to have the professions learn to work together and respect one another's roles in health care."

CYNDA JOHNSON, MD

Med School Program Incorporates Oral Health Education

Medical students in the Virginia Tech Carilion School of Medicine classes of 2014 and 2015 are engaging in specific education on oral health through a new program that includes nearly 30 hours of oral health education and clinical experience in students' first two years of medical school, according to an American Dental Association article.

The Oral Medicine/Oral Health component comes through a collaborative effort among Charles "Bud" Conklin, DDS, associate professor, Department of Surgery, Virginia Tech Carilion School of Medicine; Cynda Johnson, MD, Virginia Tech Carilion School of Medicine's president and founding dean; and George A. Levicki, DDS, president and CEO, Delta Dental of Virginia.

The new education program includes lectures and clinical training on general oral medicine and oral health, oral exams, oral cancer, oral manifestations of systemic disease, common oral pathologies, medical management of patients, and clinical skills training on-site at the dental clinic, the ADA reported. The new curriculum also includes an annual oral health lectureship to highlight the important link between oral health and overall health.

"One of our faculty members, a family practice physician, captured the value of this model best when she told me that it had inspired her to change the way she performs patient exams," Johnson said. "That's exactly what we're hoping for — to teach physicians to incorporate oral exams into their practice and ultimately to improve health outcomes for patients everywhere."

"Our goal is to have the professions learn to work together and respect one another's roles in health care," Johnson said. "They'll then be able to work more effectively as a team in the clinics, which will improve patient outcomes."

Source: ada.org/news/7473.aspx.

Study: 'High Burden of Dental Disease' Among Developmentally Disabled

New research evaluated the oral health status of nearly 5,000 adults with intellectual and developmental disabilities and found a "high burden of dental disease" among the study population.

In the retrospective study, recently published in the *Journal of the American Dental Association*, researchers examined the electronic dental records of 4,732 adults with intellectual and developmental disabilities to investigate the oral health status of, and associated risk factors for, such adults.

The authors found that nearly 88 percent of the study population had caries experience, 80.3 percent were diagnosed with periodontitis, 32.2 percent had untreated cavities, and 10.9 percent we re edentulous.

"Information concerning the oral health status and treatment needs of adults with intellectual and developmental disabilities is essential to create best practices for inclusion in dental treatment guidelines and to develop compensatory strategies to promote and protect the oral health of this vulnerable population," the authors wrote.

According to the report, age, ability to cooperate with dental treatment, and type of residence are important considerations in identifying preventive strategies; and results of the study show even with access to specialized dental services, this vulnerable population faces significant challenges in terms of dental disease.

Source: *Journal of the American Dental Association*, 143(8):838–46, 2012.

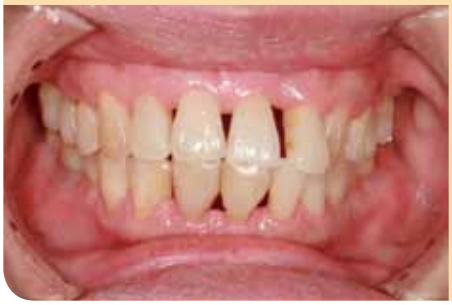
CDC Survey: Half of U.S. Adults Suffer From Periodontal Disease

Nearly 50 percent of American adults age 30 and older have periodontal disease, according to findings from a study by the Centers for Disease Control and Prevention.

Published in the *Journal of Dental Research*, the study, titled "Prevalence of Periodontitis in Adults in the United States: 2009 and 2010," reported that an estimated 47.2 percent, nearly 65 million American adults, have mild, moderate, or severe periodontitis.

The study estimated "the prevalence, severity, and extent of periodontitis in the adult U.S. population, with data from the 2009 and 2010 National Health and Nutrition Examination Survey (NHANES) cycle," the authors wrote. The 2009–2010 NHANES included for the first time a full-mouth periodontal examination to assess for mild, moderate, or severe periodontitis, making it the most comprehensive survey of periodontal health ever conducted in the United States, according to the American Academy of Periodontology.

Researchers reported finding periodontal disease to be higher in men than women (56.4 percent and 38.4 percent, respectively) and highest in Mexican-Americans (66.7 percent) compared to other ethnicities. Other segments with high prevalence rates include current smokers (64.2 percent), those living below the federal poverty level (65.4 percent), and those with less than a high school education (66.9 percent), according to the study.



"This survey has provided direct evidence for a high burden of periodontitis in the adult U.S. population," the authors concluded.

Source: perio.org/consumer/cdc-study.htm.

Oral Health and Academic Performance

Results of a new study from the Ostrow School of Dentistry of USC show that poor oral health, dental disease and tooth pain can put kids at a disadvantage in school.

The study, published in the American *Journal of Public Health*, "measured the impact of dental diseases on the academic performance of disadvantaged children by sociodemographic characteristics and access to care determinants," the authors wrote.

Researchers examined 1,495 socioeconomically disadvantaged elementary and high school children in the Los Angeles Unified School District, comparing the children's oral health data with academic achievement and attendance data provided by the school district.

Students with toothaches were almost four times more likely to have a low grade point average — below the median GPA of 2.8, the authors reported.

Roseann Mulligan, DDS, MS, corresponding author of the study, said that poor oral health doesn't appear to be connected just to lower grades; dental problems also seem to cause more absences from school for kids and more missed work for parents.

"On average, elementary children missed a total of six days per year, and high school children missed 2.6 days. For elementary students, 2.1 days of missed school were due to dental problems, and high school students missed 2.3 days due to dental issues," Mulligan said. "That shows oral health problems are a very significant factor in school absences. Also, parents missed an average of 2.5 days of work per year to care for children with dental problems."

Further studies are needed to unbundle the clinical, socioeconomic, and cultural challenges associated with this epidemic of dental disease in children.

Source: "The Impact of Oral Health on the Academic Performance of Disadvantaged Children," in the September 2012 issue of the *American Journal of Public Health*.

The great payoff is that one's conscience is wiped clean. The spot has been bleached away.

MORAL BLEACHING, CONTINUED FROM 843

off is that one's conscience is wiped clean. The spot has been bleached away.

Before the onset of the age of instant social media communication, families with good names to protect bought off the dalliances of their scions (and probably still try). A speeding ticket can be fixed. A dentist can settle a disagreement with a patient. This is private justice — an accommodation between the concerned parties that does not involve society at large.

The best known research study on phenomenon of moral bleach involved problems day care centers have with parents picking up their children late. Reminders, admonitions, and appeals to responsibility did not work. Eventually, a group of day care centers hit upon the idea of charging a per-minute late fee to the foot-dragging patents. Big impact!

The rate and extent of delinquency increased dramatically under the new system. Parents figured that they were no longer responsible for their promises because they were purchasing the right to flout the rules. They had bleached their moral obligations. When the day care centers reverted to previous rules, the tardiness rate remained high. They had taught parents how to sidestep moral responsibility.

There is strong evidence in the psychology literature that extrinsic rewards push aside intrinsic ones.

About 30 years ago, I tested this idea in a dental school course. Students made health presentations at grade schools and submitted reports. All students received the same level of detailed objective feedback. Half of the reports were graded A through F (and the full range was evident), and half were simply told that their participation was sufficient. Students were later asked whether they had an interest in participating in such programs in the future and whether they intended to do this sort of thing as part of their practices. Results: Those who received an extrinsic reward in the form of a grade expressed significantly less interest in participating in this sort of public professional service. The grade bleached out a positive public attitude.

The Nub:

1. We have been given a conscience for a reason: It is unwise to pay to disable it.
2. Legal remedies are sometimes necessary, but they do not address moral failings.
3. Is the modern epidemic of giving prizes for the sake of sponsor PR actually eroding the very motivation it claims to honor?

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

UPCOMING MEETINGS

2012	
Nov. 4–10	U.S. Dental Tennis Association, Tuscon, Ariz., 800-445-2524 or dentaltennis.org
2013	
Feb. 7–9	20th anniversary Conference and Exhibition, Academy of Laser Dentistry, Palm Springs, laserdentistry.org
April 7–13	U.S. Dental Tennis Association, TOPS'L Resort, Destin, Fla., 800-445-2524 or dentaltennis.org
April 11–13	*CDA Presents the Art and Science of Dentistry, Anaheim*, 800-CDA-SMILE (232-7645), cdapresents.com
Aug. 15–17	*CDA Presents the Art and Science of Dentistry*, San Francisco, 800-CDA-SMILE (232-7645), cdapresents.com
Oct. 31–Nov. 5	154th Annual Session, New Orleans, ada.org/session
Nov. 3–9	U.S. Dental Tennis Association, Big Island, Hawaii, 800-445-2524 or dentaltennis.org

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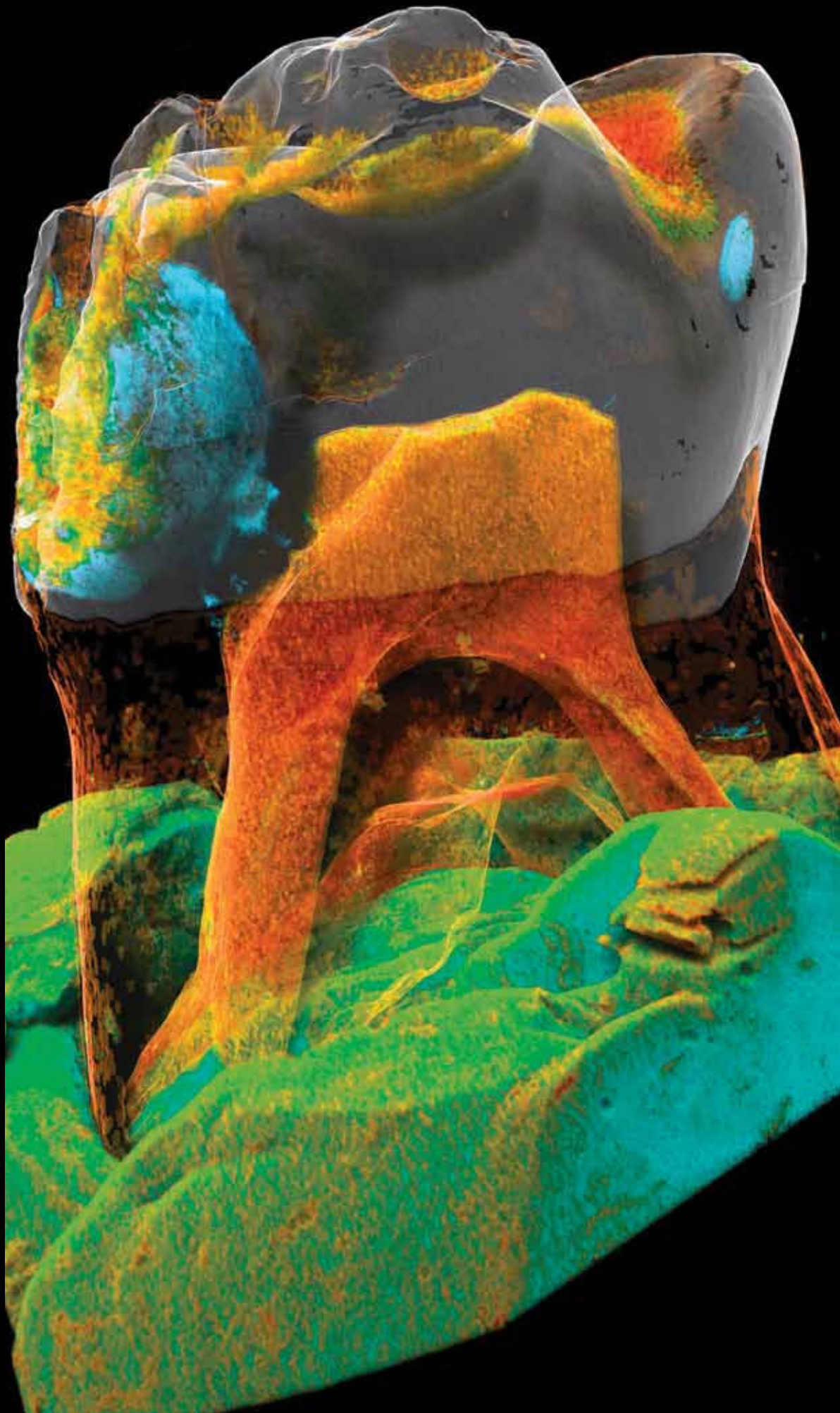

CDA JOURNAL, VOL 40, Nº11

Back to the Future: The Medical Management of Caries Introduction

STEVEN DUFFIN, DDS

ABSTRACT Based on the literature, a protocol was developed involving the application of 25 percent silver nitrate directly to cavitated caries lesions, immediately followed by 5 percent sodium fluoride varnish. This protocol results in arrest of active caries lesions. This minimally invasive treatment is well-accepted by patients and reduces anxieties related to dental office visits.

AUTHOR

Steve Duffin, DDS, owner of Shoreview Dental LLC, practiced general dentistry for 30 years. He obtained a microbiology degree from the University of California, Los Angeles, in 1979 and his DDS degree from Emory School of Dentistry in 1983. *Conflict of Interest Disclosure: Steven Duffin, DDS, is owner of Shoreview Dental, LLC.*

In the late 1970s, it looked like the dental profession might be close to finding the cure for caries—the world's most prevalent disease. Initiation of community water system fluoridation programs in the 1950s plus the introduction of fluoridated toothpaste substantially cut caries rates across many demographics in America. And there was talk of a caries vaccine that would be available in 10 years or so that would essentially eliminate the disease.[1]

Thirty-something years later, in many ways, things have not changed that much. Even today, there is still talk about a possible caries vaccine that would be available in 10 years. In more affluent populations within the United States, caries is a relatively minor health concern. Multiple studies show that 20 percent of the population have 80 percent of dental caries. Those high caries rate populations are characterized by lower socioeconomic status. Contributing factors for high disease rates may be increased exposure to dietary sugars, lower dental IQ, and ineffective oral hygiene practices.[2]

What has changed is that we now have a much greater awareness that despite good oral health for a large proportion of Americans, there are great disparities among different populations within the United States; some continue to have a high prevalence of caries, and a correspondingly high morbidity from the disease. This is especially true for the children of some racial and ethnic minority populations, as was pointed out in the Surgeon General's report on Oral Health in America in the years 2000 and

FIGURE 1. Initial setup for subsequent application of silver nitrate and fluoride varnish.

FIGURE 2A.

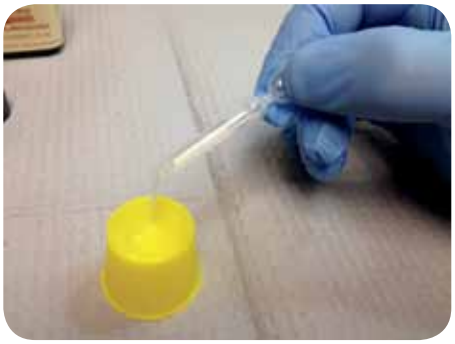

FIGURE 2B.

FIGURE 2. Transfer of 25 percent silver nitrate from bottle to dappen dish for subsequent application using a microbrush.

2012 and in a recent front-page article in the *New York Times*.[3-5]

To try to eliminate these racial and ethnic oral health disparities, the response of the dental public health community has been logical: Do more of what has worked well for the more affluent populations. This has included increased emphasis on community water system fluoridation and use of fluoride-containing toothpaste, plus adding school-based fluoride varnish and sealant programs. Despite these laudable efforts, there is an increasing awareness that these methods are simply inadequate to provide protection for the children at highest risk—many of whom have such severe caries in the primary dentition (CIPD) that they require full-mouth restoration under general anesthesia.[6] The belief that doing more of the same preventive measures will be successful in high-risk populations has not proven to be effective. Despite all of these public health efforts at prevention, disease rates continue to rise in these high-risk populations.[7]

In 2005, the author's clinic began treating 2,500 Medicaid patients in a locale where there had been very limited access to dental care. This location was overwhelmed with cases of children with advanced caries, many of whom needed to be scheduled right away for in-hospital restorations. Emergency calls from parents with children in dental pain seemed to be a nightly occurrence. This frustration led to the search for a better approach to preventing and managing caries—especially for the young children—than the methodologies available at that time.

This comprehensive search was comprised of all of the literature on the microbiological etiology of caries and how it had been approached by some of the founding fathers of the modern dental profession, including W.D. Miller, G.V. Black, and Percy Howe. It was impressive that, beginning with Miller, all three had utilized the known antimicrobial compound, silver nitrate, in solution to arrest active caries.[8] Black developed a protocol using multiple applications of silver nitrate directly to the lesion until it became hard and totally arrested.[9] Percy Howe, first research director of the Forsyth Institute in Boston, spent much of his time treating the poor working class children of Boston in addition to conducting research projects and training dentists from all over the world. Howe was so well-known for his successful treatment of caries with silver nitrate that beginning in the 1920s many dental professionals referred to silver nitrate solution simply as "Howe's solution."[10,11] In addition to these reports from the founders of modern dentistry at beginning of the 20th century, an extensive review of the more recent literature was formative in developing the silver nitrate solution followed by fluoride varnish protocol.[2,12-21]

And then, sometime around the middle of the 20th century, the dental profession seemed to forget this history of successful management of caries using silver nitrate. Perhaps it was the increasing affluence of the country, increasing access to dental care, or decreasing acceptability of the black appearance caries develops once arrested by silver nitrate. Regardless, by the 1960s, silver nitrate was no longer being routinely used in the United States for control of caries, nor was any other antimicrobial product adopted to replace it.

Methods: Back to the Future — Adopting G.V. Black's Protocol in 2005

After a thorough review of the literature, Black's protocol of multiple applications of silver nitrate to control caries was implemented at the clinic. His experience and observations suggested that silver nitrate would be a safe and effective alternative to surgical restorations for the extensive lesions seen on a daily basis at this location.[9] The question of possible silver nitrate toxicity has been well-addressed in four publications.[10,22-24] In the quantities recommended by this protocol, toxicity from silver nitrate is not considered to be a concern. However, the possibility of an allergy to silver nitrate or silver ion compounds is a known contraindication and should be a consideration during the informed consent process.

After acquiring a bottle of 25 percent silver nitrate (25 percent silver nitrate and 75 percent purified water) from Henry Schein, Inc., (Gordon Laboratories) informed consent was obtained and a tiny amount was carefully applied directly on the child's caries lesions with a microbrush. When the child returned the following week, the lesions were dark and hard, and on subsequent visits it appeared that the active caries had been fully arrested.

Encouraged by this first success, use of this procedure was continued on other patients with active cavitated caries. Over time, this protocol was refined to be more effective. Empirically, it appeared that applying fluoride varnish over the area treated with silver nitrate would have the multiple benefits of (a) preventing any contact of the silver nitrate with the soft tissue; (b) providing a protective layer to keep the silver nitrate from being washed away by saliva; plus (c) adding the benefits of fluoride.

The setup (**FIGURE 1**) and execution of this protocol could hardly be simpler. Before implementing this protocol, a tooth-by-tooth evaluation should be conducted to determine whether a sufficient layer of dentin remains between the carious cavitation and the pulp. Tools to assist in this assessment include radiographs, presence or absence of symptoms in the tooth, color or surface texture of the lesion, and dimensions of the lesion. There should be a minimum of 1 mm of healthy dentin between the advancing front of the lesion and the pulp, which can be observed via radiographs. Do not apply if there are any signs of pulpitus or draining fistula, visual signs of pulp in the lesion (pink color), or if the cavitations are large enough that they likely border the pulp. Doing so prevents the silver nitrate from reaching tooth pulp in sufficient quantity to be painful and theoretically induce pulpitis. Following of this protocol has never resulted in pulpitis at the clinic.

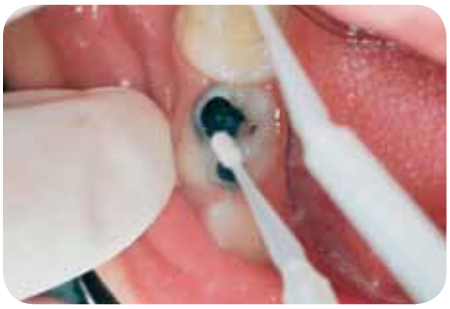

FIGURE 3. Silver nitrate application, using a microbrush, to cavitated lesion.

FIGURE 4. Application of 5 percent sodium fluoride varnish over silver nitrate in cavitated lesion

FIGURE 5. "Little black scar" as a result of silver nitrate application to cavitated lesion.

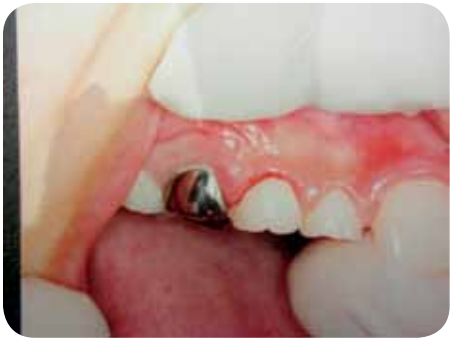

FIGURE 6. Appearance of tooth after addition of tooth colored filling.

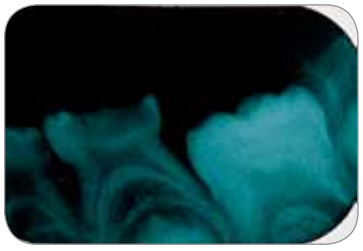

FIGURE 7. Radiograph demonstrating presence of secondary dentin after silver nitrate followed by fluoride varnish protocol.

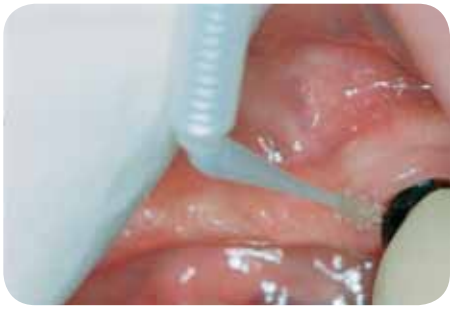

FIGURE 8. Root cavity after silver nitrate/fluoride varnish treatment.

Once it has been established that the patient is a viable candidate for the protocol, begin by transferring the silver nitrate from the bottle, via micro pipette (Henry Schein item No. 2013051), to a small dappen dish (Henry Schein item No. 294487) (**FIGURE 2**). After drying the lesion, apply a single drop of approximately 17 µl of 25 percent silver nitrate solution using a microbrush (Henry Schein item No. 1078831) to upward of eight caries lesions (**FIGURE 3**). Immediately cover with a 5 percent sodium fluoride varnish preparation; fluoride varnish used by the clinic was manufactured by Centrix (**FIGURE 4**). After all the caries lesions have been treated in this way, apply 5 percent sodium fluoride varnish to the rest of the child's teeth. Repeat silver nitrate solution and 5 percent sodium fluoride varnish application to all carious lesions at two, four, eight, and 12 weeks. Evaluate the state of caries arrest at each time interval. Discussion about restorative options with patient and/or parents is done at week 12.

Great success was observed in arresting active caries from this combination therapy. However, the dark appearance of the arrested lesions (**FIGURE 5**) was of concern to some the parents because the unfavorable cosmetic appearance. It was explained to parents that the silver nitrate kills all cavity causing bacteria, but in doing so it leaves a "little black scar" on the tooth, and that after four to six weeks, it is possible to place a tooth-colored filling without the need for local anesthesia (**FIGURE 6**). This explanation has been readily accepted by patients and parents, and the cosmetic concern is much less of an issue now.

Results

By the end of 2011, the clinic had treated more than 5,000 children with the silver nitrate followed by fluoride varnish protocol over the previous five years. Overall, these findings suggest that this protocol has achieved complete arrest of active caries in almost all the teeth for which it was used. This clinical impression has been reinforced in situations where radiographs were taken of the treated teeth after completion of the protocol. There is clear evidence of new secondary dentin formation at the base of the lesion (**FIGURE 7**). The formation of secondary dentin following arrest of the lesion may explain why restorations can be subsequently placed without the need for local anesthesia. When a restoration is chosen, a full discussion about the advantages and disadvantages of the restorative materials glass ionomer, composite, and amalgam is held with the patient. Currently, the clinic has an assignment of approximately 2,500 Medicaid patients, of whom 80 percent are children. The first three years were spent working through the backlog of children with extensive, deep cavitations. At that time, the practice experienced an annual average of 20 full-mouth restorations under general anesthesia.

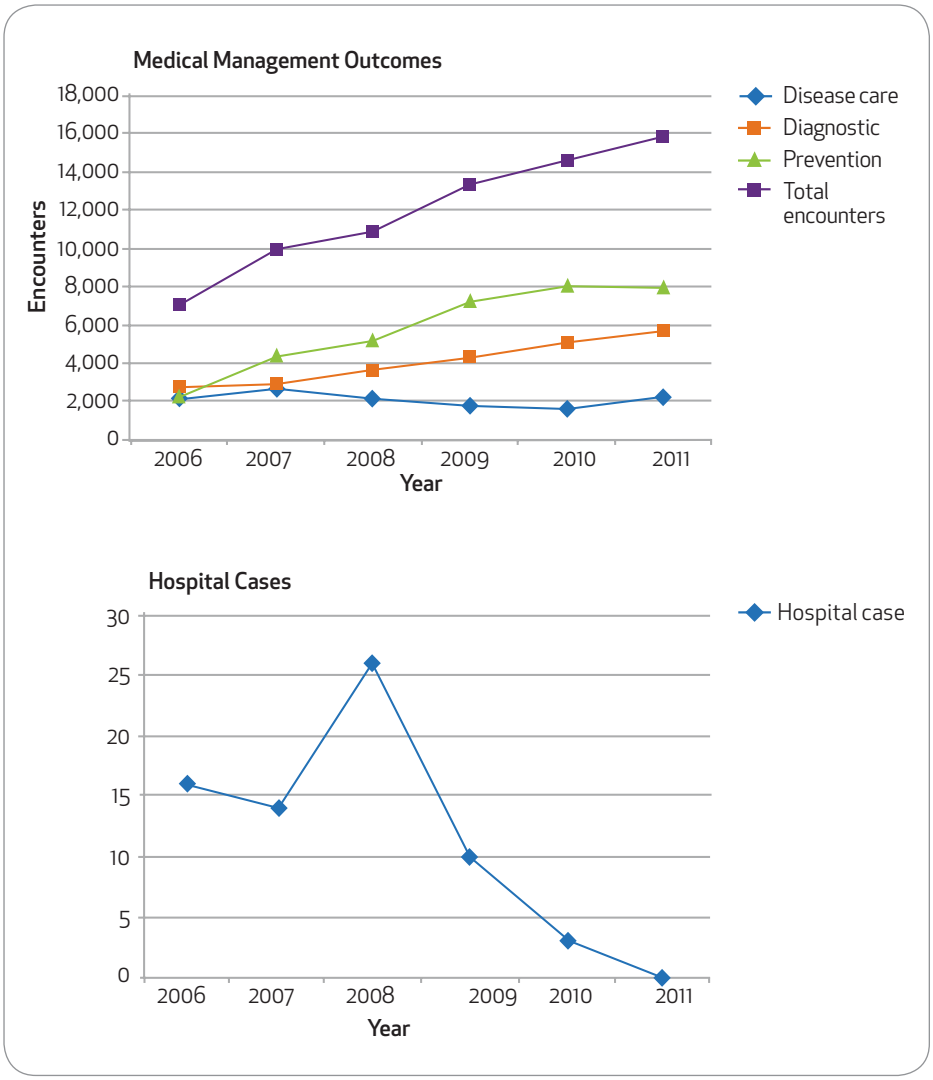

FIGURE 9. Medical management outcomes and hospital cases.

Since then, with increasing use of the silver nitrate followed by fluoride varnish protocol, each year fewer children have required operating room treatment. By 2011, zero children required in-hospital restorations. No significant adverse effects were observed while using this protocol. To try to confirm the apparent effectiveness of this treatment protocol, an outcome analysis of children in the caries management program was conducted. This analysis was difficult to perform because the protocol was implemented as clinical practice rather than research. In addition, the clinics dental software was not designed to keep track of lesions that become arrested and do not need a restoration.

To maintain randomization, this analysis involved selecting every 10th chart from the clinics patient records, from A to Z, and selecting children who had received the caries arrest protocol. This resulted in a sample of 106 children between 2-12 years of age; they had a minimum of 1 and mean of 5.2 follow-up visits within 30 months after the initial treatment. In these children, 578 caries lesions were identified at the date of initial examination. Upon review, only seven of the 578 treated teeth subsequently required extraction due to continuing pathology. The clinic had continued to follow the status of the treated teeth in these children and found that for this random sample, 98 percent of the lesions remained arrested for up to four years after treatment.

Even though no outcome data has been obtained for the adults and senior citizens in this practice, it is the dentist's clinical impression that they are getting the same magnitude of benefit as the children. This is particularly important because these patients frequently use multiple medications leading to a high prevalence of xerostomia and increased rates of root caries. When older patients are assessed, many of whom are in long-term care facilities, and they are told that their root cavities can be treated with medicine that removes the need for immediate restorations, they are very agreeable to this plan (**FIGURE 8**).

Discussion

The clinic offers a comprehensive, family-based caries prevention program that is focused on primary prevention through good diet and hygiene and regular dental checkups.25 However, when a patient presents with cavitated lesions, whether child or adult, after explaining the procedure and obtaining written consent, the silver nitrate followed by fluoride varnish protocol is used to prevent extension of the disease. The patient response has been extremely gratifying. There is a dramatic decrease of apprehension many of the patients feel due to their previous experiences of having restorations done while they were in pain from active lesions. It is often observed that other family members, including young children, watch the treatment so t hey too will be less apprehensive about future dental clinic visits.

The overall effect of using this medical management approach, when the primary prevention measures have not been successful, has substantially affected the nature of the practice. Although the clinic still has the same number of patients enrolled for services, there are now far more visits for prevention and diagnostic purposes than for restorations. **FIGURE 9** shows the breakdown by purpose of visit for adults and children between 2006 and 2011 and the number of hospital cases.

Summary

When primary prevention measures have not been successful, use of 25 percent silver nitrate followed by 5 percent sodium fluoride varnish results in arrest of advancing caries lesions. The elimination of active disease creates an improved environment for the placement of restorations. Since this protocol involves multiple patient visits, it provides the opportunity to more effectively treat the primary infection and better convey prevention messaging such as oral hygiene instruction and dietary counseling. These atraumatic patient encounters reduce their overall anxieties associated with dental care visits.

A tooth-by-tooth evaluation would be conducted to determine whether a sufficient layer of dentin remains between the carious cavitation and the pulp. There should be a minimum of 1 mm of healthy dentin between the advancing front of the lesion and the pulp, which can be observed via radiographs. Do not apply if there are any signs of pulpitus or draining fistula, visual signs of pulp in the lesion (pink color), or if the cavitations are large enough that they likely border the pulp. Doing so prevents the silver nitrate from reaching tooth pulp in sufficient quantity to be painful and theoretically induce pulpitis.

This protocol introduces a new technology to reduce the incidence of disease burden in children and adults with the highest need. Implementation of this protocol into the public health infrastructure could drastically reduce the need for treatment of extensive dental restorations under general anesthesia. While findings utilizing this protocol have been very positive, there exists research opportunities to better understand the mechanisms behind this highly effective treatment. ■■■■

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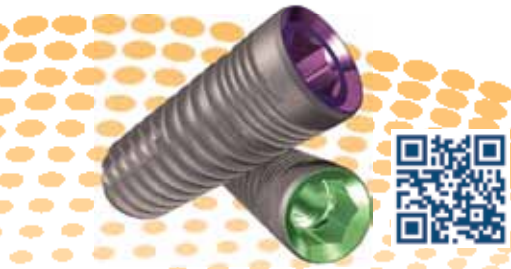

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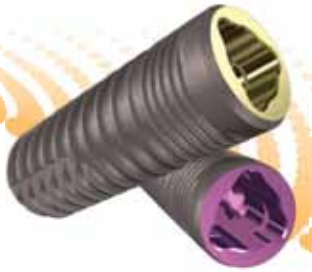

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CDA JOURNAL, VOL 40, Nº11

Spina Bifida and Dental Care: Key Clinical Issues

ANURADHA GARG, BDS, MDS, AND AMEET V. REVANKAR, BDS, MDS

ABSTRACT Spina bifida is a birth defect affecting the spinal column, resulting from failure of neural tube closure during the first month in utero. It is associated with varying degrees of neurologic and orthopedic impairment. This article presents an overview of spina bifida discussing its correlation with dental caries, latex allergy, pulmonary function, craniosynostosis, and morphology of sella turcica, and explains the role of the dentist in countering these problems.

AUTHOR

Anuradha Garg, BDS, MDS, is a senior lecturer, Department of Orthodontics and Dentofacial Orthopedics, School of Dental Sciences, Sharda University, Greater Noida, India.
Conflict of Interest Disclosure: None reported.

Ameet V. Revankar, BDS, MDS, is an assistant professor, Department of Orthodontics and Dentofacial Orthopedics, SDM College of Dental Sciences and Hospital, Dharwad, Karnataka, India.
Conflict of Interest Disclosure: None reported.

Spina bifida is a type of neural tube defect that results from failure of neural tube closure during the first month in utero.[1,2] The health care needs of children with spina bifida are complex. Specialists, generalists, and an integrated system are required to deliver this complex care.[3]

Patients with spina bifida can encompass a wide range of disabling conditions such as cognitive deficit, pulmonary function abnormalities, scoliosis, hip, foot and leg deformities, bowel and bladder dysfunction, and short stature. Predisposition to dental caries, latex allergy, and craniosynostosis causing maxillary deficiency are some of the key problems in spina bifida. Appraisal of sella morphology may help assess any pathology in the pituitary gland.

Adequate knowledge could assist the dentists to help diagnose the defects by studying cephalometric radiographs and clinically assessing the associated changes in the craniofacial morphology.

Methodology

A literature search using Medline database/Pubmed/Google was conducted for the years 1980 to 2012. MeSH terms used were "spina bifida," "special needs," "latex allergy," "dental caries," "craniosynostosis," and "sella turcica." Also included were searches of the Cochrane Database of Systematic Reviews and websites of national and international dental organizations. Only articles and websites that provided English-language materials were considered.

Overview of Spina Bifida

This birth defect has an average worldwide incidence of one to two cases per 1,000 live births. In the United States, the annual incidence is 0.7 per 1,000 live births.[2,4]

The etiology of spina bifida is unknown, although environmental factors (e.g., infection, anticonvulsant drugs, repeated X-ray exposure) could

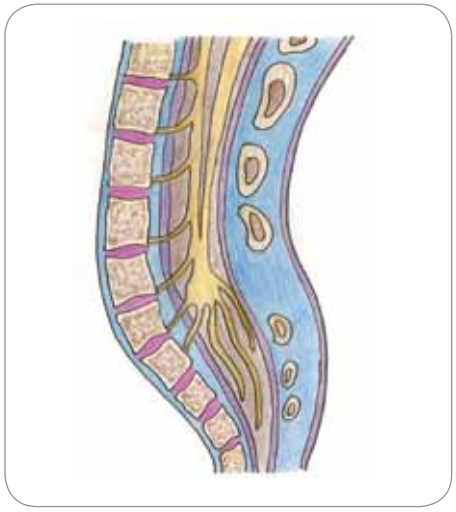

FIGURE 1A.

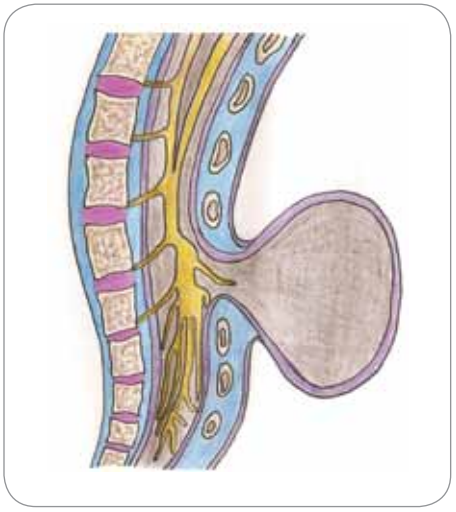

FIGURE 1B.

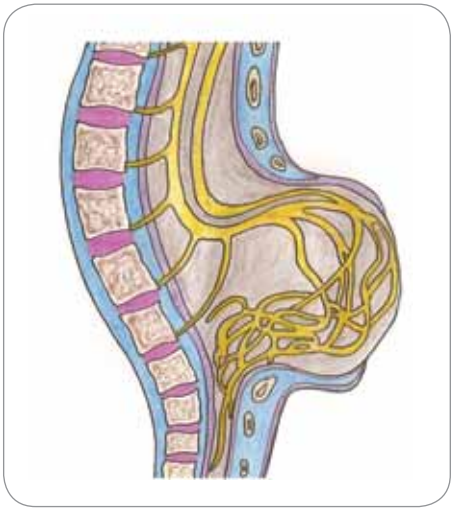

FIGURE 1C.

FIGURE 1. Types of spina bifida: A) spina bifida occulta; B) meningocele; and C) myelomeningocele.

be implicated. Folic acid (0.4 mg/day), taken by the mother before and during pregnancy, has been shown to reduce neural tube defects. Affected people appear to have an abnormal metabolism of folic acid suggesting that the underlying problem may be an inborn defect in folic acid metabolism rather than a simple deficiency in this nutrient.[4]

Three types of spina bifida have been recognized: Spina bifida occulta, meningocele, and myelomeningocele[2,4] (**FIGURE 1**).

- *Spina bifida occulta:* The defect is not visible and the skin is left intact. There is no herniation of central nervous system contents. It rarely results in symptoms or complications and is usually discovered accidentally on a routine radiographic examination.
- *Meningocele:* It is a more severe type of defect where the membrane surrounding the spinal cord enlarges, creating a cyst filled with cerebrospinal fluid. The sac is covered with skin and neural tissue is not involved. The dorsal aspects of vertebrae do not fuse and only the meninges herniate through the defect.
- *Myelomeningocele:* Also known as spina bifida cystica, this is the most common and most severe form where the meninges and spinal cord herniate through the defect and are visible on the outside of the body. The neurologic impairment depends on spinal level of the defect. This is commonly associated with hydrocephalus and requires surgical repair.

Myelomeningocele and Dental Care

A general principle is that the higher the spinal dysraphism, the greater the neurologic and orthopedic impairment. Higher level defects are associated both with greater severity of brain malformations and poorer cognitive and motor outcomes.[5]

The American Academy of Pediatric Dentistry (AAPD) defines special health care needs as, "Special health care needs include any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services or programs. The condition may be congenital, developmental, or acquired through disease, trauma, or environmental cause and may impose limitations in performing daily self-maintenance activities or substantial limitations in a major life activity. Health care for individuals with special needs requires specialized knowledge acquired by additional training, as well as increased awareness and attention, adaptation, and accommodative measures beyond what are considered routine."[6]

Patients with mental, developmental, or physical disabilities who do not have the ability to understand and assume responsibility for or cooperate with preventive oral health practices are susceptible to dental caries and periodontal breakdown. Oral health is an inseparable part of general health and well-being.[7] Despite these physical and particular learning disabilities, individualized educational programs can help these children to develop skills necessary for autonomy in adulthood.[8] Dental care of special needs patients is complicated due to a combination of factors that might include lack of motor ability, intellectual deficit and difficulty to open the mouth to permit adequate hygiene or treatment.[9]

The child may find it difficult to hold his mouth open for long periods of time and to control his tongue movements and swallowing. Adaptive dental aids such as a bite block, or a mouth prop need to be placed between the teeth to keep the mouth open and reduce the stress on the muscles. A tongue retractor helps to keep the tongue in one place. A rubber dam can be stretched over the teeth to prevent inhalation and swallowing of foreign materials or substances.

Children born with myelomeningocele have a 90 percent chance of having hydrocephalus. In a population-based retrospective cohort study of California births from 1991 to 2000, the prevalence of congenital hydrocephalus was 5.9 per 10,000.[10] Chiari malformation, an anomaly of the hindbrain present in nearly all patients with myelomeningocele, is the primary cause of hydrocephalus which causes cognitive deficits.[11,12] Occasionally, hydrocephalus spontaneously arrests. For the most, fluid needs to be drained from the cerebral ventricles with a shunt, usually into the peritoneum (ventriculo-peritoneal shunt) or the shunt may be directed to the right atrium of the heart (ventriculo-atrial shunt). Although shunt infection is an infrequent complication of dental treatment, antibiotic prophylaxis to prevent infective endocarditis in susceptible patients undergoing invasive dental procedures has become an accepted standard of care in patients who have a ventriculo-atrial shunt.[13] Extractions and scaling/root planing are perceived to be higher-risk procedures. Highly specific guidelines have been promulgated and updated periodically.[14] Penicillin is the antibiotic most commonly recommended for shunt prophylaxis by both pediatric dentists and neurosurgeons.[15]

Most children with myelomeningocoele have some degree of weakness of their lower extremities and many have significant orthopaedic problems. Muscle imbalance ensues as a result of denervation.[16] Depending on the level of the lesion, interruption of the spinal cord at the site of the spina bifida defect causes various degrees of leg paralysis, paraplegia, quadriplegia, scoliosis, bladder sphincter disturbances, incontinence of urine and faeces, anesthesia of the skin and deformities of hip, knee, foot and leg are seen.[1,4] There may be growth hormone

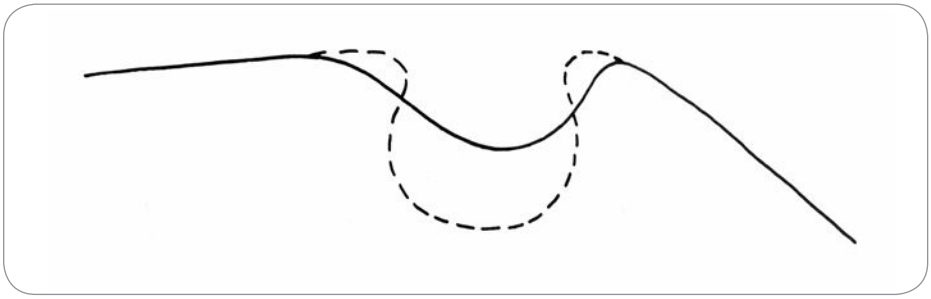

FIGURE 2. Sella turcica morphology in normal subjects (dotted line) and in myelomeningocele patients (solid line).

deficiency resulting in short stature. Orthopedic management should be aimed at correcting deformities, maintaining posture, and promoting ambulation.

Prescription of these devices is best done by a collaborative effort of the orthopedist, orthotist, and physical therapist. The patient might find it difficult to sit in the dental chair throughout an appointment. The dentist may use padding in the treatment chair and change the body position frequently to avoid pressure sores and pain. The majority of patients with spina bifida will use a wheelchair or orthotic device. They might need to be treated in the wheelchair or a unit that has a modification to accept a wheelchair or to employ some means of handling the patient from wheelchair to dental chair with a slide. Also, an assistant might be needed to help the child to get in and out of the chair and assist with dental procedures.[13]

Children with spina bifida are more prone to childhood dental caries because their neurological impairment can make preventive oral health care difficult resulting in poor oral hygiene.[4] Dental health in children with these special needs is as essential as immunizations, regular physical examinations, and attention to injury prevention. People with spina bifida have no unusual dental problems. The oral health will be affected by consideration of the degree of physical impairment and use of liquid oral antibiotics for persistent urinary tract infections. Some people with spina bifida may take medications that cause oral side effects such as gingival hyperplasia. Patients with myelomeningocele are usually at a high caries risk and activity due to poor oral hygiene, frequent snacking, fermentable carbon hydrate-rich diet, poor nutritional intake, and prolonged use of sugar-containing medications.[17,18] This causes bacteria to be retained in the oral cavity, making teeth susceptible to decay.

Also, parental anxiety concerning other problems associated with the defect frequently delays dental care. If the arms are paralyzed, it may be difficult for the child to brush and floss without assistance. These children must be seen for extensive dental rehabilitation and appropriate measures should be taken to prevent dental caries according to guidelines given by American Academy of Pediatric Dentistry.[19] Education and nutritional counselling of the parents are necessary. A regularly scheduled dental visit starting as soon as the first tooth erupts is essential. Parents or caregivers should be encouraged to clean or assist the child with brushing their teeth twice daily with fluoridated toothpaste and flossing. The use of an electric toothbrush can be beneficial due to lack of manual dexterity.[20]

Latex allergy prevalence in children with spina bifida ranges from 28 percent to 67 percent and their susceptibility to latex reactions including urticaria, conjunctivitis, anaphylaxis is 500 times more than the general population.[2,19,21] Early and repeated mucosal exposure to latex allergens involving the use of latex products (e.g., gloves, catheters, IV tubing, blood pressure cuffs) for multiple surgeries such as catheterization for neuropathic bladder and placement of shunts to manage hydrocephalus has been reported to be the cause of latex sensitivity.[22]

Also, an association between latex allergy and foods such as avocados, kiwi fruits, bananas, and chestnuts has been found, indicating that various foods are risk factors to spina bifida patients.[23,24] Genetics has also been suggested as the cause. Single nucleotide polymorphisms of dihydrofolate reductase and methylene tetrahydrofolate reductase results in an increased susceptibility to spina bifida.[25] Two natural rubber latex proteins, Hev b1 and Hev b3, have been found to be associated with the hypersensitivity.[26,27]

Children with the defect should be tested for possible latex allergy but it is important to note that children tested negative are capable of becoming allergic in the future. Individuals known to be latex sensitive should wear medical identification and should keep a prefilled emergency syringe with injectable epinephrine to use if exposure occurs. Proper latex precautions should be taken in all dental appointments in all patients with spina bifida regardless of their test status.[28] Avoiding latex products is the cornerstone for primary prevention of latex sensitization and to prevent development of specific IgE antibodies in nonsensitized children. Dental products containing latex include gloves, dental dams, mouth props, orthodontic elastics, toothbrush handles, polishing points, suction tips and impression materials.[20] It is standard protocol to treat all patients with spina bifida as latex sensitive regardless of their test status.

Brain stem dysfunction due to Chiari malformation results in apnoeic episodes and pulmonary function abnormalities.[29] Potential sedation and anesthesia complications in spina bifida may be due

to anomalies of the thoracic, lumbar, and sacral spine. There is a need to maintain an adequate airway. Recommendations for presedation evaluation include radiologic evaluation for vertebral anomalies, upper and lower airway obstruction or defects and cardiac and pulmonary function.[30] Elevation of total serum IgE along with a clinical history is a more specific predictor of anaphylactic reactions occurring during surgery in children with spina bifida.[31] Patients who have not had a reaction but are in a high-risk group are not routinely pretreated nor any special precautions used but a high index of suspicion is maintained during and after the case. Management requires thorough preoperative preparation by the maxillofacial surgeons and anesthetists to decrease the risk of anaphylactic response during anaesthesia. Regimens vary but usually include provision of a latex-free environment and preoperative administration of steroids, H2 antagonists, and antihistamines.

True craniosynostosis is seen in primary microcephaly where there is lack of expansion of defective brain and this failure of cerebral impulse leads to premature suture closure. Similarly, in overdrained hydrocephalus, both the absence of normal brain pulsations and the reduced intracranial pressure might stimulate sutural fusion. Hydrocephalus usually becomes evident in myelomeningocele after its surgical repair.[32] Treatment generally consists of surgery to relieve pressure on the brain and the cranial nerves. In craniosynostosis, several sutures in the head and facial bones may be fused resulting in abnormal skull shapes, flat midface and protruding eyes. Maxilla may be contracted resulting in crossbite and severely crowded teeth.

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Maxillary advancement surgery along with orthodontics helps correct severe underdevelopment of the midface, provides greater protection for the eyes and improves airway.[29,33]

In myelomeningocele, malformation of sella turcica is found invariably and malformed basilar part of occipital bone may be observed. The contour of anterior wall of sella is found to be obliquely oriented in an antero-posterior direction instead of following a normal cranio-caudal direction. The landmark thus appears to be broad with either a diverging anterior wall or both anterior and posterior walls, giving an impression of a wide sella turcica with less depth than normal (**FIGURE 2**). It is unknown if this change is due to the malformation per se or a result of deformation caused by associated hydrocephalus.

Also, parts of adenohypophyseal tissue have been found to be displaced extracranially in the pharyngeal mucosa.[34,35] Patients with myelomeningocele might have endocrinological disorders such as precocious puberty. Measurement of sella and appraisal of its morphology, thus, bears a clinical significance that it can be valuable to assess any pathology in the pituitary gland.[34,36]

The contour of perpendicular cranial segment of anterior wall of sella is stable in childhood and serves as reference structure for growth analysis.[37] Because orthodontists regularly analyze a considerable number of lateral cephalograms, they may be the first to diagnose the minor malformations of sella turcica.

Discussion and Concluding Remarks

Spina bifida has an immense importance to the dental profession. Prevention is the key to the management of these children so that they do not require dental treatment. A thorough history should be taken regarding latex allergy and the medications taken by the child. Dental and medical treatment should be coordinated and medical clearance should be obtained before performing any major treatment. An effort should be made to limit the dental appointments to a comfortable length of time and the child's physical impairment should be considered while accommodating him into the dental chair and operatory. Also, the chances of increased caries and periodontal problems in spina bifida patients should be well taken care of by the dentist. The dentist should avoid exposing infants to latex products. Those with surgically placed tubes or shunts must receive premedication with antibiotics before they go through any invasive dental treatment.

Oral and maxillofacial surgeons and orthodontists have a great role to play in assessing craniofacial malformations and facial skeleton morphology and treating craniosynostosis cases with appropriate surgeries. Scrupulous preoperative preparation should be done and cardiac and pulmonary functions should be assessed prior to performing any orthognathic surgery. Alteration of the cranial base angle and sella turcica morphology can be evaluated from the cephalograms by the orthodontists and dentists. Dentists, therefore need to be well-educated about these malformations, their etiology, screening and preventive measures, and relevance to the profession. ■■■■

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Timothy G. Giroux
DDS/Broker

ASK THE BROKER

Question:

Are there new tax consequences for buying and selling a practice in the future?

Writing this in mid-October, none of us know what the outcome of the November election will be. One of the candidates promises to raise all of our taxes. The other one is promising not to, but who knows if no taxes on the "rich" will result in growing the GDP and increasing the revenues. Government revenues will have to go up to pay the amazing amount of debt we are acquiring every day. We do not know if the "Bush" tax cuts will expire, be extended or revised. Talk with your accountant to get his opinion and gain insight on what the best strategy or course of action is for your own personal situation.

Most folks believe the capital gains tax will go up. We just do not know if it will increase from 15% currently to 20 or 25%. Perhaps it will go up on a sliding scale. We also do not know if any change will be retroactive to the year the law is changed. (While most of us feel that a retroactive bill would produce a great outcry, the current president might embrace the obvious class warfare stance that would imply.)

This issue relates to the allocation of purchase price in a practice transition. There is usually a battle between the Seller trying to place as much of the asset in the capital gain category versus the Buyer trying to place as much of the asset into other categories that would allow them to depreciate the asset quicker. While this argument lessens if the capital gains rate goes up, there has always been an argument that the Buyer might benefit from saving some of his deductions for later years. Hopefully, the practice will grow more profitable over time and the owner will then be in a higher tax bracket due to the increased profit. Most of us feel that eventually we will return to some sort of increased progressive rate no matter who gets elected.

The buyer's loan is also weighted much heavier in the early years with interest deductions. However, in the later years of the loan, the payments are mostly principle and there is no offsetting deduction. Therefore the deduction is more valuable in the later years to offset the increased tax rate. This also makes more sense now as inflation is so low. Ultimately, the argument between Buyer and Seller comes down to it costing the Seller a measurable amount of money which is burned up in taxes, compared to the Buyer who might even benefit from keeping some of the deductions for later.

We are currently exploring some ideas of placing a practice sale into a Deferred Sales Trust. My next article will explore the opinions of the accountants I respect as to whether that vehicle is worth exploring and what its effects are on both Buyer and Seller.

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

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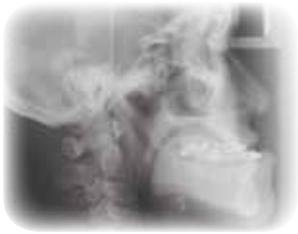

Evaluation of the Relationship Between Vertical Facial Height and the Morphology of the Temporomandibular Joint in Skeletal Class 3 Patients

MAHROKH IMANIMOGHADDAM, DDS, MS; FARZIN HERAVI, DDS, MS; AZAM SADAT MADANI, DDS, MS; ABBAS MOHAMMADI, DDS, MS; AND PARVIZ MARUZI

ABSTRACT Class 3 patients may have relatively high prevalences of temporomandibular disorders; therefore, joint morphology can be important for their orthodontic-surgical treatments. The aim of this study was to evaluate the relationship between facial height and TMJ morphology in skeletal class 3 patients.

AUTHORS

Mahrokh Imanimoghaddam, DDS, MS, is an associate professor, Dental Research Center of Mashhad University of Medical Sciences, Department of Oral and Maxillofacial Radiology School of Dentistry, Mashhad, Iran.
Conflict of Interest Disclosure: None reported.

Farzin Heravi, DDS, MS, is an associate professor, Dental Materials Research Center of Mashhad University of Medical Sciences, Department of Orthodontics, School of Dentistry, Mashhad, Iran.
Conflict of Interest Disclosure: None reported.

Azam Sadat Madani, DDS, MS, is an associate professor, Dental Research Center of Mashhad University of Medical Sciences, Department of Prosthodontics, School of Dentistry, Mashhad, Iran.
Conflict of Interest Disclosure: None reported.

Abbas Mohammadi, DDS, MS, is an assistant professor, Department of Oral & Maxillofacial Radiology, School of Dentistry, Yazd, Iran.
Conflict of Interest Disclosure: None reported.

Parviz Maruzi is a consulting instructor of medical sciences, Mashhad University of Medical Sciences, Mashhad, Iran.
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Management of skeletal class 3 malocclusions may be one of the most challenging problems for orthodontists and oral and maxillofacial surgeons. Undiagnosed asymptomatic temporomandibular joints (TMJ) deformities can make this treatment more complicated and jeopardize the results with adverse reactions.[1]

Therefore, exact evaluation of TMJ morphology seems to be necessary in class 3 skeletal patients. Previous studies on skeletal class 3 patients showed that although most of these patients had no symptoms of TM problems, there was some evidence of morpholigic changes in their radiographic images.[2]

TABLE 1

Statistical Results of Comparison Between Right and Left Joints (Paired T-test)

Qualitative morphologic parameters TMJ	Standard deviation	Number	Mean	Aspect	P-value
AE	6/974	20	41/00	Left	0/458
	7/021	20	41/85	Right	
A	0/93816	19	2/2789	Left	0/390
	1/12980	19	2/4863	Right	
P	60575	19	3/1442	Left	0/917
	95969	19	3/1200	Right	
Fossa ratio	18/02899	19	18/8032	Left	0/337
	19/48688	19	13/62	Right	
&	12/686	20	136/75	Left	0/169
	14/136	20	133/40	Right	
C	0/92247	18	3/29	Left	0/320
	1/14590	18	3/52	Right	

TABLE 2

Relationship Between Facial Height and Morphologic Indices of TMJ (One-way ANOVA)

Morphologic index	Standard deviation	Mean	Facial height	P- Value
AE	7/736	41/37	Normal	0/630
	7/312	42/44	Long face	
	4/175/4	39/50	Short face	
A	0/71242	2/1975	Normal	*0/044
	0/93574	2/1400	Long face	
	1/40429	3/1775	Short face	
P	0/70692	3/2325	Normal	0/762
	0/98064	3/1043	Long face	
	0/63624	2/9800	Short face	
Fossa ratio	17/41279	19/7168	Normal	*0/021
	13/00181	21/0311	Long face	
	22/99290	0/1516	Short face	
&	15/148	137/44	Normal	*0/049
	11/676	137/75	Long face	
	8/379	124/75	Short face	
C	0/76274	3/5925	Normal	0/488
	1/37259	3/1262	Long face	
	0/84351	3/4163	Short face	

*Significant P values

Therefore, evaluation of the morphology of the TMJ seems to be mandatory in patients with skeletal malformations before orthodontic or surgical treatments. To date, only a few studies have been done to find out a relationship between mandibular prognathism and TMJ morphology.[2-4]

Previous studies have concentrated on the correlation between joint morphology and jaws relationship in different malocclusion groups (class I, class 2, class 3)[2-4] and in symmetric and asymmetric, and also in open-bite, and deep-bite patients.[5-11] These studies concluded that internal derangement of the TMJ is associated with asymmetry of mandible.

But correlation between TMJ morphology and facial height was not evaluated.[2,4,6] The aim of the authors' study was to determine any correlation between facial height and joint morphology in symmetric class 3 patients. The authors used MRI images due to their safety and reliability.

Materials and Method

This is a cross-sectional study on 20 (five females and 15 males) orthodontic patients admitted to the Department of Orthodontics of Mashhad Dental School. All patients were examined by an expert prosthodontist for any symptom of TM problems. Inclusion criteria were as follows:

- They were all skeletal class 3 patients;
- They did not have any symptoms of TM problems;
- They were all symmetric;
- No craniofacial disorder;
- They had no edentulous sites; and
- No previous history of orthodontic therapy or trauma on facial complex.

Similar to other clinical studies, patients were informed about the study and informed consents were signed by them.

Radiographic Techniques

Lateral Cephalogram

A lateral cephalogram was obtained for each patient during admission to the orthodontic department. All cephalograms were taken in the Department of Oral Radiology of Mashhad Dental School with a Planmeca 2002 CC (Helsinki, Finland) machine. Tracing of all cephalograms was done manually by an orthodontist. And based on FMA, Go-Gn to Sn and posterior facial height to anterior facial height ratio, patients were divided into three different groups of short, normal, and long face.

Magnetic Resonance Imaging

An MRI was obtained from each TMJ of patients by Magnetom Avanto Ziemens Super Conductive 32 Channel system with two receivers' coils, which were 6 cm in diameter (1.5 T, Germany) in Razavi Hospital.

To capture MRI imaging, patients were asked to lie supine while a head holder stabilized their head in a fixed position in which the Frankfort horizontal plane was perpendicular to the table surface. After taking axial images for determination of the condyle long axis, corrected sagittal images were taken with Repetition Time (TR) =500 ms and Echo Time (TE) =10 ms, for T1 and TR= 2400 ms and TE = 42ms for T2 images.

An oral and maxillofacial radiologist evaluated all images and recorded data on a checklist containing qualitative factors like the position of the condyle in the glenoid fossa, the shape of the disk, the position of disk in relation to the condyle with closed mouth, and the angle of the articular eminence.

Morphologic Factors of TMJ (Qualitative Indices)

According to the position of the condyle in the fossa, patients were divided into three groups with upper, lower, and medial position of condyles.[11]

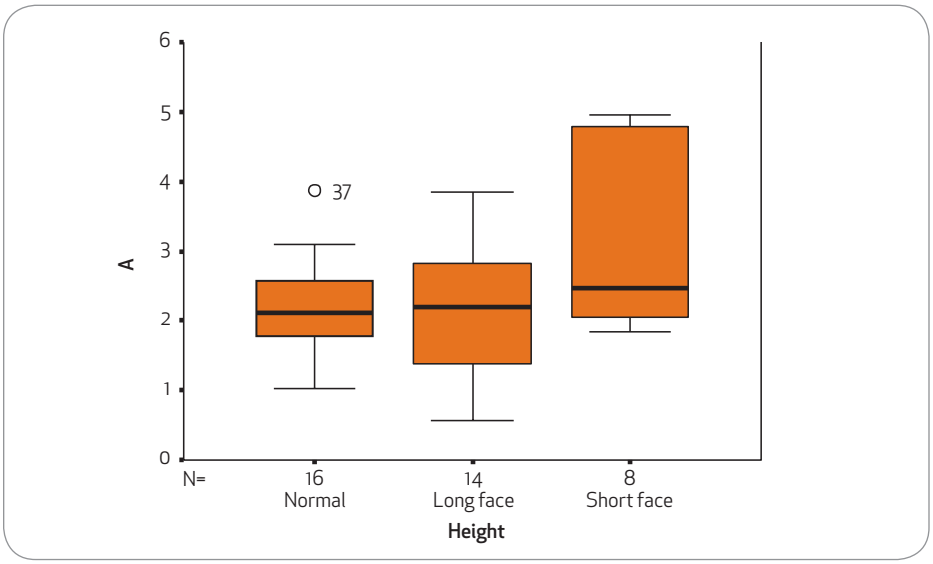

FIGURE 1. Box plot showing distribution of anterior condylar space among different malocclusions.

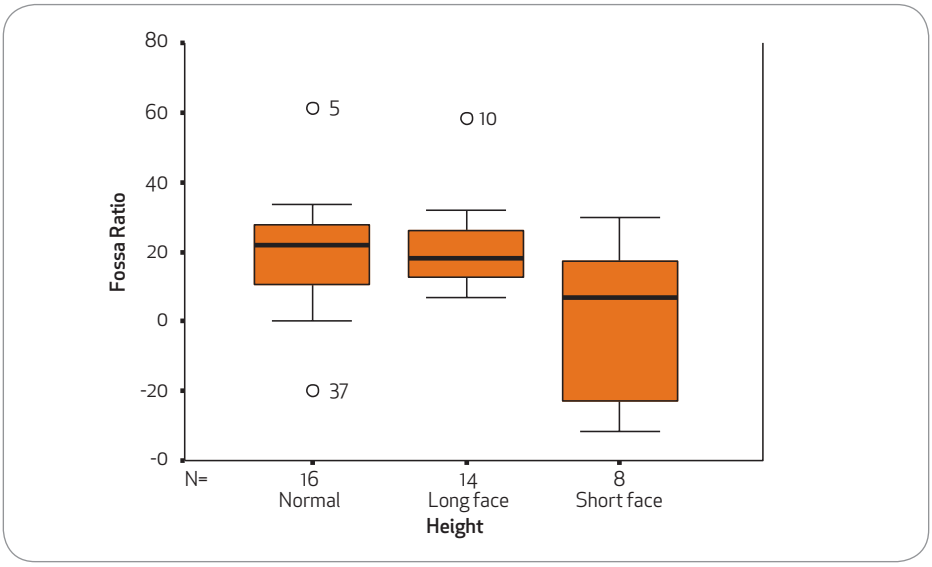

FIGURE 2. Box plot showing distribution of condylar position in the glenoid fossa in different malocclusions.

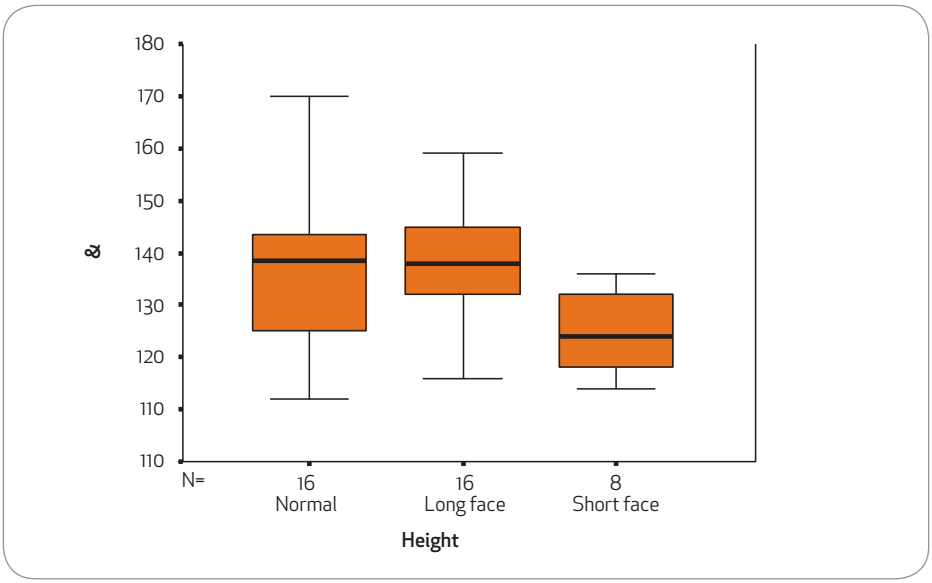

FIGURE 3. Box plot showing anterior condylar head angle in different malocclusions.

The shape of disks were divided into six groups according to Orham: normal (Biconcove), lengthened, biconvex, rounded, folded and thick posterior bond.[12] Disks had three different positions in the closed-mouth status: normal (superior), anterior, and posterior to the condyle. The authors used the method of Toller and coworkers for this classification.[13]

Morphologic Factors of TMJ (Quantitative Indices)

Linear and angular measurements of the angle of articular eminence and condylar position in the glenoid fossa were done by Diamaxis software of RVG system (Finland) on the basis of Goklap and Cohlmia's work.

Disk displacement was classified based on the study of Toller et al.[13] A line was drawn from the lower part of posterior condylar tubercle to the apex of articular eminence. The midpoint of condyle was determined on this line and the angle between this line and the line tangent to the posterior wall of disc was measured. To determine the intra-examiner error, all measurements were repeated after two weeks.

Statistical Analyses

The T-student and paired t-test was used to compare quantative indices in joints and between the genders. By Pearson analysis, the correlation between qualitative indices and skeletal features was evaluated. The chi-square and Fisher's exact test were used for assessment of qualification of joint morphologies.

Results

Twenty patients with skeletal class 3 malocclusions who met the inclusion criteria were admitted in this study. MRI and lateral cephalometric images were assessed and patients divided into three groups: eight normal cases (seven males and one female), eight long face (four males and four females), and four short-face male patients. Both joints were evaluated in all patients (40 joints). The mean value of patients' age was 23.65 ± 3.8 years.

There was no significant difference between morphologic characteristics of right and left joints (P-value > 0.05)(**TABLE 1**).

There was a significant difference, as illustrated in **TABLE 2**, quantitative indices in TMJ morphology among the groups. After the ANOVA test, post-HOC test of LSD proved a significant difference between A point, fossa ratio and Q angle in short-face patients compared with normal and long-face patients (**FIGURES 1-3**).

Using the Fischer exact test, the authors found that condylar position and skeletal groups were independent. As illustrated in **TABLE 3**, the most frequent position of the condyle was inferior (29 cases).

There was no difference between disk shapes in closed mouth among three groups. The most frequent types were the lengthened (21 cases) and thick posterior band (eight cases) (**TABLE 4**).

Disk position and skeletal groups were independent in a closed-mouth position. Anterior displacement of disk was seen 42 percent in long face, 7.5 percent in short face, and 25 percent in normal cases.

As is shown in **TABLE 5**, there was a significant, positive relationship between condylar head angle and articular angles and anterior facial height and Go-Gn-Sn.

TABLE 3

Frequency of Condylar Position in Glenoid Fossa (Chi Square Test)

Expected cases	Observed cases	Condylar position in Glenoid fossa
12/7	3	Centric
12/7	6	Superior
12/7	29	Inferior
38	38	Sum of cases
P value=0.00 df=2		

TABLE 4

Frequency of Disk Shape in Closed-Mouth Position (Chi Square Test)

Expected cases	Observed cases	Disc shape
6/2	5	Normal
6/2	21	Lengthened
6/2	1	Bioconvex
6/2	1	Rounded
6/2	1	Folded
6/2	8	Thick posterior band
37	37	Sum of cases
P value=0.00 df=5		

There was also a negative correlation between PFH/AFH and condylar head angle and fossa ratio.

Discussion

Treatment of class 3 patients is one of the most challenging problems in orthodontics and oral and maxillofacial surgery. The aim of this study was to evaluate the TMJ morphology in these patients and to see if there was a difference.

As with other studies, there was no difference between right and left joints.[3,14] In contrast to Cohlima's study, no definite correlation was proved between the slope of anterior eminence and facial height.[15]

In the authors' cases studied, the condyles were positioned anteriorly and inferiorly. Seren[16] had proposed that elongation of the condyle in the medio-lateral aspect could force the condyle inferiorly. The findings in this patient group showed a significant difference between the short-face cases and the two other groups. In these short-face cases, the condyles are more posterior. A fossa ratio of about zero is consistent with this finding.

Byun and Ahn6 had suggested that the lower posterior facial height and ramus height are important factors in producing internal derangements. This study did not support any significant difference between groups. The discrepancy could be explained by the existence of asymmetric patients in Byun's study.

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TABLE 5

Pearson Correlation Between Quantitative Morphological Indices and Facial Skeletal Indices

P-value	Pearson correlation coefficient	Skeletal parameters	1.4031 in
0/002	**0/469	S-Ar-Go	Condylar head angle
0/035	*0/335	N-Me	Condylar head angle
0/022	*0/362	Go-Gn-Sn	Articular angles
0/009	**0/409	PFH/AFH	Condylar head angle
0/029	*0/354	PFH/AFH	Fossa ratio

* P value<0.01
** P value<0.05

It is suggested that an increase in condylar angle, which can be seen in class 2 patients, may contribute to internal derangements.

In the authors' study, the condylar angle in short-face patients was significantly lower than the two other groups, but the joint disorders were similar.

Lengthened disks were the most frequent type of disks found in the authors' cases (73 percent in normal, 57 percent in long face, and 25 percent in short-face cases).

Thicker posterior band types were seen in 6 percent of normal, 21 percent of long face, and 50 percent of short-face patients. The inferior position of the condyles in the fossa may explain this finding.

Articular angle (S-AR-Go) had a positive correlation with anterior facial height and a negative correlation with PFH/AFH ratio. This means that by increasing the facial height, the condylar head angle will decrease. Clinical relevance of such a finding is not clear at this time and needs to be investigated further.

Conclusion

- Differences in facial height had no significant effect on TMJ internal derangement.
- Condyles seated more medially in short-face class 3 patients.
- With increasing facial height, condylar head angle decreases. ■■■■

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Recurrent Aphthous Stomatitis: Stress, Trait Anger and Anxiety of Patients

YEHUDA ZADIK, DMD, MHA; LIRAN LEVIN, DMD; TOM SHMULY, DMD; VADIM SANDLER, DMD; AND RICARDO TARRASCH, PHD

ABSTRACT In this case-control study, recent stress and trait anger/anxiety of otherwise healthy patients with active recurrent aphthous stomatitis were compared to those of dental patients with no history of RAS (controls). RAS group reported more angry/anxious feelings than controls (2.11±0.38/1.84±0.30, respectively; $p<0.001$), and more recent stress (2.81±1.36/1.96±1.02; $p<0.01$). Among subjects with high angriness/anxiety, RAS subjects showed higher stress level ($p<0.005$). The study revealed that anger/anxiety level mediates the relationship between stress level and RAS.

AUTHORS

Yehuda Zadik, DMD, is chief dental officer, Israeli Air Force Surgeon General Headquarters, Israel Defense Forces, Tel Hashomer, Israel, and with the Department of Oral Medicine, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel.
Conflict of Interest Disclosure: None reported.

Liran Levin, DMD, is with the Department of Periodontology, School of Graduate Dentistry, Rambam Health Care Campus, and Faculty of Medicine, Technion, IIT, Haifa, Israel.
Conflict of Interest Disclosure: None reported.

Tom Shmuly, DMD, is with the Department of Oral and Maxillofacial Surgery, Rabin Medical Center, Beilinson Campus, Petach Tikva, and Sackler Faculty of Medicine, Tel Aviv University, Israel.
Conflict of Interest Disclosure: None reported.

Vadim Sandler, DMD, is with the Department of Endodontics, Hebrew University-Hadassah School of Dental Medicine, Jerusalem, Israel.
Conflict of Interest Disclosure: None reported.

Ricardo Tarrasch, PHD, is with the School of Education and the Sagol School of Neuroscience, Tel Aviv University, Tel Aviv, Israel.
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Recurrent aphthous stomatitis (RAS), also known as recurrent aphthous ulcerations and canker sores, is a common condition of unknown etiology characterized by recurrent, painful, single or multiple shallow self-limited ulcerations on nonkeratinized oral mucosa. Clinically, there are three types of RAS, namely the minor, major, and herpetiform types (**FIGURE 1**). RAS affects 20 to 30 percent of the general adult population.[1,2] The peak age of onset is the second decade. Factors that were found to be associated with RAS include genetics, higher socioeconomic status, nutritional deficiencies, allergies, mechanical injury, chemicals (e.g., sodium lauryl sulfate), hyposalivation, cessation of tobacco use, and possibly certain foods and preservatives.[1-3] Neville et al. clustered these factors into

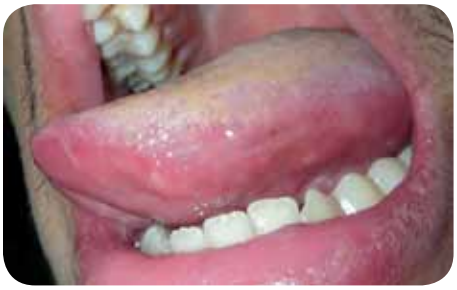

FIGURE 1A.

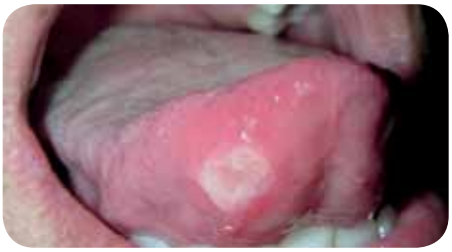

FIGURE 1B.

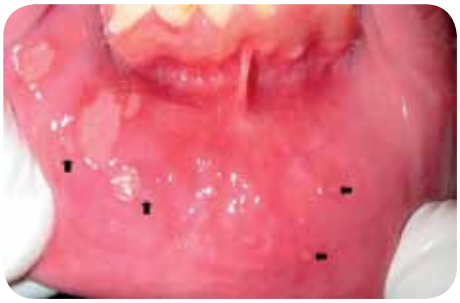

FIGURE 1C.

FIGURE 1. Examples of the three clinical types of recurrent aphthous stomatitis (RAS): (a) the common minor type (less than 1 cm in diameter, heals without a scar), (b) the uncommon major type (diameter of 1 cm or larger, heals slowly, often with scar), and (c) the rare herpetiform type (multiple very small ulcers, arrows, and larger ulcers with irregular outline that created by collection of several small ulcers). The study population was of patients suffered from minor RAS.

three categories, namely primary immunodysregulation, decrease of mucosal barrier, and increase in antigenic exposure.[2]

Well-accepted is the association between the appearance of aphthous stomatitis lesions and psychological features, mainly stress and anxiety, in patients who are predisposed to this condition.[2,4] Often, patients themselves reported a relation of lesions appearance to periods of stress.[5,6]

Surprisingly, despite this common acceptance of stress as a triggering factor for RAS by both medical professionals and lay population, a literature search yielded only few studies on this issue. Moreover, there is no consensus among these studies' results. Ship et al. described RAS among students, in which emotional factors (anxiety) were found to have a strong correlation with RAS.[7,8] In another study, higher levels of stress and anxiety, but no depression, were found among 18 RAS patients in comparison to 20 control patients.[9]

Using the Social Readjustment Rating Scale, which includes 43 items of psychosocial life events that usually evoke or are associated with adaptive or coping behavior of an individual, Pedersen studied the psychologic stress of 22 RAS patients in time of active lesion and compared it to the same patient's stress in time of no intraoral lesion. No statistically significant difference between the two stages was found; even among nine patients (41 percent) who subjectively considered psychologic stress a factor in the development of their own RAS lesions.[5]

Although the majority of studies have been unable to validate the role played by stress in the development of RAS, the literature continues to indicate that stress may play a role in precipitating RAS.[3] The aim of the presented study was to evaluate stress and trait anger/anxiety among patients suffering from RAS as compared to controls. The authors hypothesized that beside higher stress, RAS patients show a higher anger/anxiety level.

Methods

This case control study included 26 patients with active RAS lesions (cases) as well as 55 dental patients, with no history of RAS (controls). All subjects underwent a thorough oral mucosal examination by two examiners, using a dental mirror (No. 5 front-surface) and cotton gauzes as needed, to confirm the clinical appearance of aphthous lesion (RAS group) or the absence of ulcerative lesion (control group). Inclusion criteria included the presence of one or more minor (i.e., diameter of 5 to 10 mm) shallow aphthous lesion in the nonkeratinized oral mucosa (i.e., labial/buccal mucosa, lateral/ventral tongue, soft palate, or floor of the mouth), with the patient reporting the recurrent nature of that kind of lesions, started at childhood or early adolescence. Diagnosis of RAS was made clinically; no biopsy was taken. Special emphasis was paid in differentiating RAS from recurrent herpetic ulcerations according to their unique clinical features.

Exclusion criteria included patients who presented in the office because of the aphthous lesion or other dental or oral pain, patients with first appearance of aphthous lesions, patients with traumatic or other preceding trigger for the lesion known by the patient or found by examiners, and patients with systemic diseases (i.e., anemia, Behçet, celiac, inflammatory bowel diseases, periodic fever, and carriers of human immunodeficiency virus) or taking medications known to be related to oral ulcers (e.g., nonsteroidal anti-inflammatory drugs, nicorandil) or hyposalivation (e.g., anticholinergics, antihistamines, antihypertensives).[10]

Subjects completed a battery of psychological questionnaires to assess three factors, namely stress during the past month (a single question), trait anxiety, anger and curiosity, and attachment style.[11]

The trait anxiety, anger and curiosity questionnaire used is a Hebrew translation of the State-Trait Personality Inventory (SATPI) that is comprised of 30 items in a 1-4 Likert scale assessing state anxiety and anger (e.g., "I easily lose my self-control").[12,13] Attachment style was assessed by means of a single question as recommended by Mikulincer.[14]

Data was stored in Microsoft Excel software and statistically analyzed in SPSS 18 (SPSS, Inc., Chicago, Ill.) employing t-test, cross tabs, two-way analysis of variance (ANOVA) and Tukey HSD post

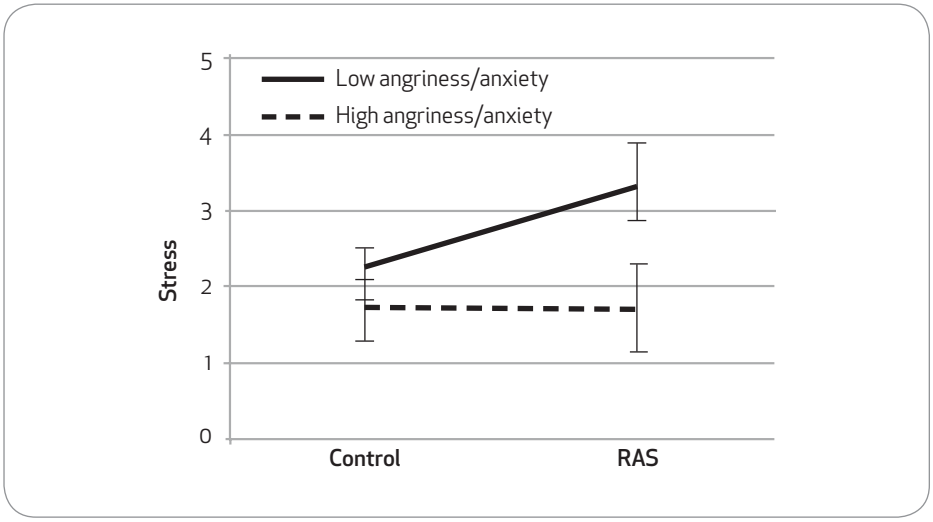

FIGURE 2. Stress level of recurrent aphthous stomatitis (RAS) and control groups, split by the angriness/anxiety median (1.93) to low and high angriness/anxiety.

hoc analyses. For the anxiety, anger and curiosity items, positive questions were recoded and a single measure named angry/anxiety was computed by averaging the 30 items (Chronbach's alpha=0.84). For each of the variables anger/anxiety and stress, the groups were compared by means of t-tests for independent samples. Statistical significance was accepted at the probability level of $p<0.05$.

Results

RAS (cases) group included 15 men and 11 women, and the control group included 43 men and 12 women. All those participants were otherwise healthy adults with no chronic illness or chronic medications.

Most subjects were categorized as having a secure attachment style (RAS 76.9 percent, controls 83.6 percent), and only minority as avoidant (19.2 percent, 14.5 percent, respectively) or anxious-ambivalent (3.8 percent, 1.8 percent, respectively).

RAS subjects reported more angry/anxious feeling than controls (2.11±0.38, 1.84±0.30, respectively; $t(79)=3.43$, $p<0.001$, Cohen's $d=0.79$), and more stress during the past month (2.81±1.36, 1.96±1.02, respectively; $t(79)=3.21$, $p<0.05$, Cohen's $d=0.71$).

When subjects were split by the angriness/anxiety median of the overall sample (1.93) to low and high angriness/anxiety relatively to other patients participating in the study, and two-way ANOVA using group and angriness/anxiety as independent variables and stress as the dependent variable a significant effect of group ($F(1,77)=4.80$, $p<0.05$) was yielded, as well as a significant effect of angriness/anxiety ($F(1,77)=19.93$, $p<0.001$) and a significant interaction between them ($F(1,77)=6.03$, $p<0.05$). As can be seen in **FIGURE 2**, Tukey HSD post hoc comparisons revealed that among subjects with low angriness/anxiety no significant differences were obtained in stress levels between the RAS and control groups; however, among subjects with high angriness/anxiety control subjects showed a lower stress as compared to RAS subjects ($p<0.005$).

Discussion

Many physical ailments have psychological components that may influence the person's vulnerability to illness as well as his or her recovery.[15] Stress, the relationship between the environmental demands toward the individual and his or her ability to cope with them, is associated with undesirable physical consequences.[16] This association is based on the assumption that stress brings life changes, disturbing the vital homeostasis of the affected individual followed by a struggle to regain the primary situation. This struggle entails undesirable changes in various physical systems.[17]

The level of stress and personality characteristics have been considered as initiating, predisposing, and perpetuating factors for several diseases, and as having influence on the individual's health behavior.[18,19] However, the relation between stress and its negative outcome is not as direct as a stimulus and response, but instead is modulated by other variables. Some people are less resilient to stress, and therefore suffer more from the physical consequences of stress.[20] Personality traits, i.e., the individual's set of preferences, values, and beliefs that are expressed in behavior, can cause changes in the individual's vulnerability while facing stress; hence, they change the patient's immune response.[21] Most personality theories attempt to identify stress buffers. The most obvious are a combination of type-A personality, locus of control, hardiness, and the ability to cope. These variables decrease the apparent effect of stress.[22,23]

Stress-induced immune dysregulation and anxiety-induced parafunctional oral habits, including lip and cheek biting, causing physical trauma, were offered for explanation of the cause and effect relationship between emotional parameters and the ulcerative process in susceptible individuals.[24,25] Another possible explanation is the emotional induced hyposalivation, since lack of adequate saliva to lubricate and protect the nonkeratinized oral mucosa from injury and antigenic exposure may contribute to the development of RAS lesions.[1]

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Publisher (Name and complete mailing address)
Alicia Malaby'
1201 K St., 16th Floor
Sacramento, CA 95814-3925

Editor (Name and complete mailing address)
Kerry K. Carney, DDS
1201 K St., 16th Floor
Sacramento, CA 95814-3925

Managing Editor (Name and complete mailing address)
Alicia Malaby
1201 K St., 16th Floor
Sacramento, CA 95814-3925

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Pedersen suggested a relationship between severe emotional stress and the onset (predisposing) of RAS, but no association between psychologic stress and the *recurrence* of RAS.[5] On the contrary, Scully et al. concluded that stress may provoke episodes of RAS, but the association is not invariable.[10]

McCartan et al. found higher level of salivary cortisol as well as proportion of patients with borderline or clinically morbid anxiety among 12 RAS patients in comparison to 12 past-RAS patients (successfully treated according their hematinic deficiencies or by empirical vitamins B1 and B6). These authors concluded that stress may play a role in the etiology of RAS, particularly in patients who have an underlying anxiety trait.[26]

Consistently, the present results indicate an association between recurrence episodes of RAS and angriness/anxiety. Moreover, association was found between recent stress and the recurrence of aphthous ulcerations in the study population, and especially among individuals with high angry/anxiety trait. Among subjects with low angriness/anxiety no significant differences were found in level of stress between RAS patients and the control group. However, among subjects with high angriness/anxiety, RAS subjects showed higher stress level than controls ($p<0.005$). In the study population, attachment style was not found to be related to RAS. The present results can partly explain the inconsistent publications regarding stress as risk factors for recurrence of aphthous ulcerations. ■■■■

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

EN-026 ROSEVILLE—Warm Caring Environment, ~1000sf, w/ 3 ops . **$380k**

EN-090 CARMICHAEL - It just doesn't get any better than this! ~2000sf w/6ops. **$895k**

EG-111 ROSEVILLE – Must See! 1 of the busiest, most desirable areas. Beautiful layout with gracious, classy design and decor. Upgraded build-outs to include travertine tile in reception area. 1,760 sf w/3 ops **$210k**

EN-114 ANTELOPE FACILITY - Location, Location, Location! This "move-in-ready" practice has 4 ops + 1 add'l. **$120k**

EN-115 ELK GROVE FACILITY– Location and visibility—simply add your name! 5 ops + plumbed for 2 addt'l. **$140k**

F-1013 FORTUNA-Well respected FFS GP. Loyal stable patient base. 1,000 sf w/ 3 ops **$195k**

FN-087 LAKE COUNTY—Quality practice w/ friendly staff! ~2400sf w/3+ops. **$775k**

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

G-998 CHICO/PARADISE—Breathtaking natural beauty! ~898sf, 3 ops. **Now $240k**

HC-054 SIERRA FOOTHILLS- Seller Retiring. 1,800 sf w/ 5 ops **$600k**

G-1019 WILLOWS AREA—Small Community practice! ~1,600sf w/ 2 ops. **$152k**

GN-058 YUBA CITY— Emphasis on quality dental care / patient comfort, 1,704sf w/ 4 ops **$450K**

GN-075 YUBA CITY—Well established practice w/ loyal patient base! ~3000 sf w/ 8 ops**. $250K**

GN-103 CHICO—Successful, highly esteemed practice! ~3500sf, 8 ops + 2 addtl. **$850k**

HN-059 LASSEN CO-Quality, well-established, family-oriented practice. 1600sf w/3 ops **$120k**

FN-088 SISKIYOU CO— Family Friendly Location! ~1300sf w/ 2 ops. **$85k /Real Estate: TBD**

CENTRAL VALLEY

I-9721 STOCKTON –Prof. complex 1,450 sf w/3 ops & plumbed for 1 add'l op. **$75k.**

I-1005 SAN JOAQUIN VLY- Long-established High-End . 2,500+ sf w/ 6 ops **$650k**

IC-066 TRACY - Modern, paperless, FFS practice. Excellent visibility! 1,600 sf w/ 4 spacious, fully-equipped ops; plumbed for 2more **$495k**

IG-067 STOCKTON- Fully computerized, paperless, digitalized. 5,000 sf w/10ops **$475k**

IN-071 MODESTO– FFS/Large/stable patient base. Recently remodeled/digitalized. 2,600 sf w/7ops ***$900k***

IN-102 STOCKTON- Well-established. Seasoned staff. Unlimited potential w/increased marketing & work schedule! 1,100 sf 2 ops **REDUCED! $80k**

J-1000 TULARE– Highly visible location! ~1650sf w/ 4ops **Practice: $465k /Real Estate: $249k**

J-1001 LINDSEY— All American City! Conveniently located ~3,380sf w/5ops. **$264k**

JN-086 FRESNO FACILITY—Low Rent & Overhead! <1yr old, ~1200sf, 3 ops + poss. 4th! $**160K**

SPECIALTY PRACTICES

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

I-9461 CENTRAL VALLEY/ORTHO - .~ 1,650 sf w/5 chairs/bays + (2) add'l plumbed. **$180k**

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

BC-033 ALAMEDA CO ORTHO – ~ 50 pats/day. Highly visible. 1,250 sf w/4 Chairs/Bays **$450k**

EN-089 ORTHO- ROCKLIN AREA - Contracted as a Preferred Provider w/one of the largest Medical Systems in area. Large, stable referral base. 1,500 sf w/3 chairs/bays. Plumbed for **$350k**

AG-096 ORTHO- PACIFICA - Exc location, easy accessibility, solid referral base. Excellent opportunity for a practice merger or secondary office. 1,400 sf w/5 chairs. **$198k**

CG-105 ORTHO VACAVILLE - Strong, loyal, widespread referral base. 30+ pats/day w/ 5-6 new starts/mo. Great location! 2,000 sf w/ 4 chairs/ bays **$280k**

SOUTHERN CALIFORNIA

KF-070 BREA-Affluent, loyal, stable, well-educated patient base. Highly-esteemed practice. 2,400 sf w/2 ops. Plumbed for 3 add'l **$350k**

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- **AMADOR COUNTY:** *For Sale*-General Dentistry Practice. Owner retiring. 2011 gross receipts of $710K+. There are 4 1/2 to 5 1/2 days of hygiene on a four day week. This well designed and spacious 2,400 sq. ft. office includes 5 ops, Laser, Intra-oral camera, Dexis Digital X-ray, and Pano. Almost paperless. Av. age of dental equipment is less than 5 years. Abundant recreational opportunities are available close by. #CA510

- **ANAHEIM:** *For Sale*-General Dentistry Practice. This 3 op had $253,000 in collections in 2011. There are 3 ops in this 864 sq. ft. office with 1.5 days of hygiene. Owner works 3 days per week. No welfare or HMO's. Soft, Dentrix Software and Intra-Oral Camera. SOLD

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

- **CHICO:** *For Sale*-General Dentistry Practice. The collections in 2011 were $1,209,207. There are 7 days of hygiene in this 5 op., 2,400 sq. ft. office. Equipment includes Laser, Intra-Oral Camera, new Cone Beam X-ray and Dentrix software. This excellent practice has 1,824 active patients with 12 new patients a month. Owner will consider an Associate to Buy-In position leading to the purchase of this practice. #14392

- **CHULA VISTA:** *For Sale*-General Dentistry Practice and Building. **DECEASED DENTIST** as of March 25th, 2012. This beautiful 11 op. office located in a highly visible prime area in Chula Vista, had collections of $1,684,000 in 2011 and $1,730,000 in 2010. There are 5 days of hygiene with approx. 30 new patients per month. Lasers, Intra-Oral Camera, Pan-Ceph, etc. Practice has been in this location since 1998. 100% financing available for practice and building. Staff will stay. #14394 SOLD

- **EAST BAY:** For Sale-ENDODONTIC PRACTICE. The adjusted net income was $186,000 in 2011 in this 3 operatory, 1000 sq. ft. office. Includes Microscope, X-ray Scanner and PBS software. Transfer of referral base should be excellent. Ideal office for new endodontist or as a satellite practice for established practitioner. Dr. is retiring.

- **FRESNO:** *For Sale*-General Dentistry Practice: $935K in collections in 2011, w/adjusted net income of $337K. Office is 2,300 sq. ft. and is located in north Fresno in a highly visible professional office complex on a main thoroughfare. There are 6 equipped operatories, owner reports average age of equipment is 4 years. Practice has been operating in present location for over 20 years. Eaglesoft software, owner is retiring. #CA502

- **FRESNO:** *For Sale*-General Dentistry Facility. One of the best opportunities this year. This 3 op dental office comes equipped. It is in a great location and has about 200 active patients. Owner is in the process of completing his Orthodontic training and only works in the office 5 days a month. Complete pictures of the office and an inventory list of included furniture and fixtures are available. Everything included for only $85,000 You can't afford to pass this up. #14383 SOLD

- **GRASS VALLEY:** *For Sale*-General Dentistry Practice. Gross Receipts of $491K with an adjusted net income of $130K. Overhead 73%. Office leased 1,555 sq. ft., 4 equipped operatories, 5 available. Laser, Intra-oral Camera, Cerac, & Eaglesoft Software. Owner would like to retire. #14379

- **GRASS VALLEY:** *For Sale*-General Dentistry Practice. GR 545K 3 days/wk (4 avail). 3 hygiene days/week. 5 Ops (6 Avail) 1,950 sq ft. Refers out most/all Ortho, Perio, Endo, Surgery. Office has Laser, Intraoral Camera, Pano, & Dentrix Software. Owner retiring. #14372.

- **GRASS VALLEY:** *For Sale*-General Dentistry Practice. Owner relocating. 2011 gross receipts $505K on 4 days per week with 5 days of hygiene. This well-established practice with approximatley 1,300 active patients is located in an 1,100 sq. ft. office with 4 ops, Dentrix software, Panoramic X-ray, Cerec, Intra-oral Camera, and X-rays in all ops. #CA509

- **GRASS VALLEY:** *For Sale*-General Dentistry Practice. Owner retiring. Well-designed 1,550 sq. ft. office with 4 ops plumbed, 3 ops furnished. Gross Receipts for 2011 were $309K on easy 3 days/wk with low (47+%) overhead. Practice refers out Endo, Perio, Surgery & Ortho. Pano, PBS software. May be able to merge with another existing practice that will also be for sale in the near future, This merger would result in $800,000 gross annually. #CA503

- **GREATER CHICO/YUBA CITY:** *For Sale*-General Dentistry Practice. 2011 GR $592,520 on 4 days. 1,200 sq. ft. office with 4 equipped ops. Intra-Oral Camera, Pano, 1,100+ patients. Owner retiring after 33+ years in this picturesque and prosperous community with abundant recreation, close to the mountains and near one of the largest lakes in N. CA. #14359

- **GREATER SACRAMENTO:** *For Sale*-Periodontal Practice: Retiring owner is the only Periodontist in a comunity of 50+K with a draw area of 100K. Implant experience a must. Great opportunity to work closley with a Prosthodontist and an Endodontist. Nicely appointed 1,500 sq. ft. office with 5 operatories, Digital X-rays and Dentrix software. 2011 gross receipts of $719K. #CA500.

- **HAWAII (MAUI):** *For Sale*-General dentistry practice. Gross Receipts of $636K. Office has four equipped operatories in 1198 sq.ft. Pano, Laser, I.O. Camera, Fiber Optics, 2 ½ days of hygiene. Owner retiring: Don't miss this opportunity to live and work in paradise. #20101

- **HAYWARD:** *For Sale*-General Dentistry Practice. This practice consists of 1,600 sq ft with 4 treatment rooms in an excellent location. 2010 Gross was $610K with a $228K adjusted net income. Dental Vision software, Average age of equipment is 8 yrs. Approximately 1,200 active patients. SOLD

- **LANCASTER:** *For Sale*-General Dentistry Practice. This 4 operatory office is located in 2,360 Sq Ft on the second floor of an attractive Medical Dental office building. Gross receipts were $676,000 with a $174K adjusted net income. Dentist is retiring after 39 years. 4 days of hygiene. Additional operatories could be added to existing space. Great location. #14376.

- **LAS VEGAS:** *For Sale*-General Dentistry Practice. This 4 operatory practice is in a great location in a high-end professional building with a view of the city of Las Vegas. It is equipped with an Intra-oral camera, Pano, Laser, and Dentrix software. There are 2 days of hygiene. The staff is well trained to efficiently run this low overhead office with great potential for further growth, 2011 gross receipts were $727K with adj. net income of $331K. Doctor moving out of state. #NV500

- **LEMOORE/HANFORD AREA:** *For Sale*-General Dentistry Practice & Building. Owner has worked in this location since 1971. Gross Receipts were $378K with $139K adj. net income. There are 3 equipped operatories and 3 days of hygiene. Purchase of the building is optional to the Buyer. 100% financing is available for both building and practice. Excellent opportunity for new grad or satellite practice. #14375.

- **MERCED:** *For Sale*-General Dentistry Practice. This is a tastefully done, 4 op., 1,550 sq. ft. office with 4 and 1/2 days of hygiene/week. All equipment is less than 10 years old and includes 2 Lasers, Intra-oral Camera, Panographic X-ray, Digital X-rays, and Dentrix Software. Molar endo and involved oral surgery cases referred out. Basic general (non-amalgam) type dentistry. 2011 gross was $878,000 with 4 weeks out as a result of a medical issue. 2010 collections were $956,000. Excellent location. Seller retiring. #CA512

- **MILLBRAE:** *For Sale*-General Dentistry Practice. This beautiful, well-established office is located on the main thoroughfare of the North Penninsula, offering great exposure that generates 25-30 new patients per month. 5 treatment rooms (6th plumbed) in approx. 1,500 sq. ft. equipped with Digital Pan, Digital Imaging and Intra-Oral Camera. 2011 gross receipts of $651,000 with

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$230,000 adjusted net income. Owner is retiring. Don't delay, this won't last long! #14395

- **MODESTO:** *For Sale* - General Dentistry Practice. Collections have been approximately $700K per year with a 62% overhead on 3 days per week schedule. Six days of hygiene in this 4 op. office. Eaglesoft software and Panoramic X-ray. Approximately 2,000 active patients. Perio and Endo referred out. Excellent location. #CA505

- **MODESTO AREA:** *For Sale*-General Dentistry Practice. Owner is a senior partner in a practice set up to share expenses and reduce overhead. Each partner has their own patients, operatories, etc. Selling partner's gross receipts in 2011 were over $950,000 with only 54% overhead or $443,777 adj. net income. There are 8 days of hygiene. Intra-oral camera, Panoramic X-ray, digital X-rays, and Dentrix software. Owner is retiring. #CA506

- **MODESTO-TRACY-AREA:** *For Sale*-Pediatric Practice. $677,000 in collections in 2010 with a $357,000 net income. This 3-chair office is located in approximately 1,250 sq. ft & has recently been remodeled. Patient Base software. Office equipped for NO2 & IV sedation. Practice has operated in its present location for 20 years.

- **MOUNTAIN VIEW:** *For Sale*-General Dentistry Practice: This 2 day per week satellite office is located the heart of Silicon Valley, surrounded by most of Mountain View's largest employers. 2 fully equipped treatment rooms (expandable to 4), Pano, Digital Processor and Dentrix Software in approx.. 1500 sq. ft. With household names as your neighbors, few opportunities are this good! #14398

- **MORGAN HILL:** *For Sale*-General Dentistry Practice & Building. DECEASED DENTIST AS OF JUNE 6TH, 2012. The office and equipment are only 5 years old. The office is beautifully decorated and efficiently laid out with 5 operatories. The condominium space is located in highly visible, upscale, professional office building. 2011 gross receipts were $846,000. Intra-oral Camera, Panoramic X-Ray and Digial X-Ray. Staff and hygiene are working daily with out-of-the-area doctor covering. Approximately 1,700 active patients. #14399

- **NEWPORT BEACH:** *For Sale*-General Dentistry Practice. This 4 operatory practice is located in beautiful Newport Beach and is part of a larger office complex. Gross receipts were $490K in 2011, with an average of 20 new patients per month. The office is 920 sq. ft. with Dentrix software, Dental laser, and up-to-date equipment. #14397

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

- **NORTH OF SAN FRANCISCO:** *For Sale*-PERIODONTAL PRACTICE. Owner retiring: Great opportunity for a Periodontist with experience in dental implant placement. This well-appointed practice is located in a 1,300 sq. ft. office with 4 operatories along the 101 corridor north of San Francisco. 2011 gross receipts of $558,000. DSN software. Buyer will be the only full-time periodontist in an area with the population of approximately 60,000. #14396

- **ORINDA:** *For Sale*-FACILITY SALE. If you are thinking about relocating or building out a new office in a prime location, then you need to look at this opportunity. At half the cost or less, you can have an outstanding, fully furnished, 3 operatory office (2 additional plumbed) in a great location with good parking in an upscale building. Pictures and a complete list of equipment and furnishings are available. Office is suitable for Endo, Oral Surgery, or General Dentistry. #CA508

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

- **ROSEVILLE:** *For Sale*-General Dentistry Practice. Great Location. 2009 GR $900K with adjusted net income of $300K. 1,975 sq. ft. with 4 ops, 3 days hygiene/wk. Digital, Intra-Oral Camera, Dentrix, Trojan, fiber optics, P & C chairs - all less than 5 years old. Owner is retiring. #14327

- **SACRAMENTO:** *For Sale*-General Dentistry Practice. **Ideal start-up or satellite practice.** This is a satellite practice of the owner. this is a 5 op. office that includes Intra-oral camera, Panoramic X-ray, and Soft Dent software. 2011 gross receipts were $202,000. Average age of equipment is 5 to 10 years. Purchase price is far less than purchasing equipment and paying for leasehold improvements in a new location. This office also comes with approximately 450 active patients that provides an immediate cash flow. #CA507

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

- **SAN FRANCISCO:** *For Sale*-General Dentistry Practice. This 1000 sq. ft. office is located in the heart of the financial district. It is a corner office with each of the 4 operatories looking out at the incredible views on Golden Gate side of the bay. The 2011 collections were $1,200,000 with a low overhead. The practice averages approximately 15 new patients a month.

- **SAN JOSE:** *For Sale* - FACILITY SALE ONLY - NO PATIENTS: Exclusive Willow Glen district offering 4 fully equipped treatments rooms, 2 additional plumed, in approximately 1,900 sq. ft.. Digital Scanner, Intra-Oral Camera in a very elegant setting. This facility only sale offers favorable lease terms as well. #CA504

- **SAN LUIS OBISPO:** *For Sale* - Two Doctor General Dentistry Practice. Gross receipts $1,537,142 for 2010 with an adjusted net income of $691K. The office has 2,031 sq. ft. with 8 equipped operatories. Pano, E4D, and Dentrix software. Practice started in 1990 and has been in its present location since 1998. Approx. 3000 active patients. Great location with nice views. #14353.

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

- **SANTA BARBARA:** *For Sale*-General Dentistry Practice. Wonderful opportunity to live and work in one of California's most desirable areas. 2010 Gross Receipts were $974,000 with a $370,00 adjusted net income. Six days of hygiene. Dentrix software, Intra-Oral Camera and Panoramic X-Ray. Owner is retiring. #14382

- **SANTA CRUZ:** *For Sale*-General Dentistry practice. This excellent practice is centrally located in a professional complex. Office is approx. 1,885 sq. ft., 4 operatories with room for one additional. There are approx. 2,100 active patients with 6 days of hygiene per week. Practice Pano, Intra-Oral Camera and Easy Dental software. Owner is retiring. Reasonable lease available. #14361

- **VICTORVILLE:** *For Sale* - General Dentistry Practice. This practice is worked just on a three day a week schedule. There are 3 operatories with 10 off-street parking spaces. Practice has high visibility. The practice was acquired from previous owner in 2002. #14393

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DENTAL ASSISTANT — We are hiring a full-time dental assistant for our new office in Cypress. Requirements: Bilingual Spanish required. 0-2 years dental assistant work experience. Experience with Eaglesoft dental software a plus. CPR certification. X-ray license. Coronal polish license. Case presentation and computer skills required. Strong customer service skills and work ethic. Good communication skills. Ability to multi-task. Please email your resume to luzmarquez77@aol.com. — 818-384-2702.

DENTIST — Dentist (Fullerton, CA) valid license. Mail qualifications. Attn: Dr. Shah, 137 W. Chapman Ave, Fullerton CA 92832. Please no walk-ins. — amitshah@yahoo.com — 626-354-3936.

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GENERAL DENTIST W/PEDO EXP. — Temporary position available for a general dentist with pedo experience. Average 20 patients daily. Preferably bilingual Spanish speaking. Exp w/ nusmile crowns. Please email cover letter with resume and days available to work. Thank you for your interest! — toothfairiesdental@gmail.com.

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3086 SONOMA COUNTY GP
Seller retiring after 30 years of practice located in highly desirable suburban area. Excellent reputation with local community and relationship with large, stable patient base of approx. 1,400, avg. 15 new pts./month. State-of-the art fully-equipped practice w/pano, laser, intra-oral camera, Dentrix. 2011 GR $1.1M+, 2012 on schedule for $1.2M. Asking $828K.

3085 STANISLAUS COUNTY GP
General, family practitioner now retiring. Offering well-est. successful, state-of-the-art practice in approx. 2,800 sq. ft. facility w/7 fully-equipped ops. Great location & exceptional long term staff. Owner willing to help in transition. Estimated 2,500+ active pts. 5 year avg. GR $1.4M w/net of approx. $500K & just 3.5 doctor days & 10 hyg. days/wk. This practice is for an established dentist or 2 dentists w/experience & who will appreciate a high quality practice. Asking $895K.

3073 SAN MATEO GP
Located in highly visible single story professional building in a desirable residential professional mix neighborhood blocks from downtown. 1,100 sq. ft. office w/4 fully-equipped ops setup for right handed delivery. Recently upgraded, networked computer system using Dentrix practice software & Dentrix Digital X-ray. 3 year avg. GR $179K+. w/3 doctor days. Doctor retiring. Asking $108K.

3082 SONOMA COUNTY GP
Well-established, family-oriented practice in charming community located in the hub of Sonoma County. Stable patient base. 4 doctor days, 3 hygiene days/week. Approx. 14 new pts./month. Approx. 1,500 active pts. 3 fully-equipped ops., recently upgraded equipment, in 900 sq. ft. state-of-the-art office. 2011 GR $552K+. Asking $384K.

3083 SONOMA COUNTY GP & BLDG
Well established & respected GP known for personalized, quality dental care in a family oriented community. Seasoned staff, stable patient base, approx. 1,500 active pts. Located in the heart of Sonoma County in ample 2,088 sq. ft. facility w/6 ops. 2011 GR $767K+ w/4 doctor days. Seller retiring & willing to help for smooth transition. Asking for practice $560K. Building is also available for purchase.

3081 SANTA CLARA GP
1,200 sq. ft. 4 op., newly equipped and fully networked modern office w/ laser, Dexis digital x-ray and Dentrix practice software. Located in a well-travelled area approx. 1 mile from Santa Row. 2011 GR $208K+. Asking $145K.

3059 SANTA CRUZ COUNTY GP & BDG
Charming practice tucked among soaring redwoods in Santa Cruz County. 2011 GR $626K+ w/3 doctor days. All fee-for-service. Owner retiring and willing to help for a smooth transition. This is a great turn key practice and opportunity to own a hidden gem. Practice asking price $373K, building is also available.

3078 GILROY DENTAL FACILITY
1,280 sq. ft. turn-key dental facility w/5 ops in medical/professional office complex adjacent retirement community near Westwood Shopping Center. Great opportunity to establish a practice with little start-up cost or open a satellite office. Asking $75K.

3080 SAN BENITO COUNTY GP
State-of-the-art family practice. 1,558 sq. ft. facility. Approx. 1,100 active pts. 3 Dr. days. 2011 GR $449K+. Asking $305K.

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CLASSIFIEDS, CONTINUED FROM 890

asset to your practice. Please feel free to contact me for a copy of my CV. Thank you for your time and thoughtful consideration. — vshahnam@gmail.com — 775-741-7735.

DENTIST — Education: University of California, San Francisco DDS, 2008. Professional Strengths: I have four years of strong dental training including surgical extractions with bone grafting with or with out membranes, scaling/root-planning using Sirona laser, rotary endodontics including molars in 45 min, implant restorations and crown/bridge work. I am personable and work well with patients and staff. Certificates: Lumineer Certified Advanced Cerec Doctor — samiradds@gmail.com — 714-390-8449.

PERIODONTIST — Periodontics and implants. Experienced, reliable, easy to work with, worked in GP offices for over a decade. — dentalimplantsurgery@yahoo.com — 916-521-0000.

DENTAL OFFICES FOR RENT/LEASE

OFFICE FOR RENT OR LEASE — We're Offering a Great Opportunity to Sublease 2 Ops in our 5 Op office with a Great Locaton just off the 5 Frwy. in Irvine. The office suite is in a 3 story Medical Building. The Ops are Plumbed and Ready to Add Your Chairs, Units, and X-ray Heads. There is Plenty of Room for your Supplies and a Front Desk Area for Your Use. Ideal for Someone Looking to Cut Overhead. E-mail us at:russellcannondds@earthlink.net. Check Out Our Website at: www.DrRussellCannon.com Please call us at 949-552-7874.

OFFICE SPACE FOR SUB LEASE — Newly constructed GP office in Encino; three operatories fully equipt; sub leased two to three days a week; Ideal for Endo, Perio or Oral Surgeon. Please email: bdedental@gmail.com if interested or for more information. — 818-788-0700.

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DENTAL OFFICE TO SHARE — Looking for someone who wants to rent space in a 2 (fully equipped) operatory practice in Simi Valley. I am currently only there on Tuesdays and Thursdays. Great opportunity for a specialist to have a satellite office. Digital X-rays Digital pan located in busy outdoor mall in Simi Valley — 805-955-0181.

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FANTASTIC DENTAL/MEDICAL SPACE FOR LEASE — (Great space for Medical and Dental office such as Endo, Perio, Prostho, GP, or pediatrician office) Great opportunity to build up a great patient base in this Tri-valley Area. Beautiful office space with lots of windows and great lighting in a medical - dental building in a Hi growth & FANTASTIC family Community. Free parking for all. Minutes from 680 High way. Approx. 1529 SQFT. 4-5 operatories will fit . Asking $ 2:50 NNN. Two 5 year option Available. Contact: Mohsen 415-987-9100.

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PRACTICE FOR SALE — Located rural NE California. 5 yr old equipment, newly remodeled office, 4 OPS, PANO, Nobel Biocare Implant Sys., 3 d/wk hygiene. 2010 collections 527K on 3d/wk, 2009 collections 764K on 5d/wk. Great Christian staff, reasonable rent. Asking 175K. Prefer email contact at ddspractice4sale@yahoo.com — 530-386-5110.

SILICON VALLEY PRACTICE FOR SALE — Incredible opportunity in silicon valley. Located within walking distance from Apple, Amazon, Seagate....in a Prof. dental building Well established general practice. Nice patients and loyal staff. 3 fully equipped Ops, with 1 more plumbed. Dentrix, Dexis digital X-ray, intraoral camera. Excellent fee, only UCR and Delta premier. 3 year average collect close to 1M with just 1 DDS 4d/wk and taking at least 1 month off a year. Possibility to buy the real estate also. greatgp4u@gmail.com.

CONTINUES ON 894

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6008 MENDOCINO COAST - FORT BRAGG Cultural haven offers attractive lifestyle. 2011 collected $725,000 on Owner 3-day week. 4-days of Hygiene. Digital radiography. Computers in ops.

6020 PEDO PRACTICE - ATTRACTIVE FAMILY COMMUNITY 2012 trending $550,000+ in collections with Available Profits of $280,000+. Remarkable office with investment here topping $345,000. Computerized charting with digital Pano and Ceph. Full price $240,000.

6024 PERIO PRACTICE – SAN FRANCISCO'S SOUTH BAY On part time schedule of 19-hour week with 7-weeks off, collected $600,000 in 2011. 2012 trending Profits of $270,000. Attractive office, nice location. Full price $150,000.

6025 CENTRAL MARIN COUNTY - SAN ANSELMO Well established practice collected $490,000 in 2011 on 3-day week. 2+ days of Hygiene.

6026 SACRAMENTO 2011 collected $825,000 on 3-day week. Practice coupled with facility and location can do much more. Bring in specialists. Strong foundation can be developed into busier practice.

6027 PLEASANTON Collected $500,000 with Profits of $260,000 in 2011. Office remodeled 3-years ago at cost of $[illegible]00,000. Nice "Town & Country" feel. Adec delivery systems.

SOLD

6028 BERKELEY'S ALTA BATES MEDICAL VILLAGE 2011 collected $525,000. Collections for first 6-months of 2012 have practice tracking $600,000. Busy Hygiene schedule.

SOLD

6029 NORTHEAST CALIFORNIA - ALTURAS Trade in smog and congestion for soaring mountains and close-knit communities. 2012 tracking $600,000 on 3-day week. 3+ days of Hygiene. Strong Recall. Great staff. Beautiful office. 3-ops with Adec delivery systems. Be busy, be happy and take vacations. No worries here. Full price $185,000.

6030 SANTA ROSA AREA 2012 tracking $850,000+ in collections, reflecting growth over 2011. Strong profits. 4-days of Hygiene per week. Digital x-rays. Building optional purchase.

6031 MODESTO Owner retiring. 2012 tracking $430,000 in collections. 4-ops. Bilingual staff.

6032 MODESTO Currently collecting $520,000+ with Available Profits of $210,000. 3-days of Hygiene.

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TEMECULA - MURRIETA Senior Dentist grosses $750,000. Classic 4 Op office. Cash & indemnity - no PPO's. Take to $1,000,000 by adding PPO's. When Seller was younger, always did a Million. Only $585,000.

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REDLANDS Gross $20,000 per month. One of last chances to open in this beautiful city. Single story professional plaza. Major freeway exit. State-of-art office with 5 Ops. Full price $250,000.

ORANGE COUNTY BEACH CITY Senior Seller will assist Dentist with Specialist Team to take to $ 2 Million first year. Fantastic opportunity.

PALM SPRINGS Established 25 years. Valuable high identity Dental Building included in sale. Gross $1,200,000. Five Ops with room for more. Smooth Transition assured.

BALDWIN PARK Senior conservative Lady Dentist with high identity free-standing 1,000 sq.ft. 3-Op Dental Building. Young Buyer will do $500,000 first year. Full price for building and practice is $750,000.

LAMONT - ARVIN Dental Building and practice. Some HMO. Gross $30,000+ per month on two days. 4 Ops. Next to McDonalds. Full time DDS will gross $500,000 per year.

AT INTERSECTION OF 210 & 57 Gross $1.2 Million. Emergency sale. Seller will assist in financing.

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PALMDALE Great Practice. Shopping Center. Gross $50,000 per month.

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CEREC REDCAM — Used Cerec 3D redcam acquisition unit and milling unit. Cerec blocks, burrs, powdering unit included in sale. Software version 3.60. please call Ben Chew, DDS at 510-745-9299.

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DR. BOB, CONTINUED FROM 898

her seat, advance to the set and, grasping the channel dial between thumb and forefinger, move the pointer one quarter of an inch clockwise or counterclockwise until all viewers present agreed to leave it at one setting, whereupon the dialer regained his seat.

This accord almost never happened. As a result, early viewers on the threshold of discovering the art of sedentary channel "surfing," gained in a single evening more beneficial exercise than a 10K run sponsored by The Biggest Loser program.

At Zenith Electronics Corp. in 1955, Eugene Polley, an employee in the engineering department, sagely foresaw the day when television might blossom into 500 or more channels and viewers would risk cardiac arrest somewhere between the couch and the set vainly trying to find something worth looking at. So, he invented a device he christened the Flash-Matic, the first wireless remote control.

At last, TV viewers could change channels, alter the volume, mute the commercials, and quarrel amongst themselves over who possessed the remote control, all without leaving their seats. Skeletal musculature relaxed and in some cases disappeared altogether except for those few called into action in delivering carbohydrates to the mouth. The couch potato was born. The wireless remote inevitably evolved from Polley's simple four-function Flash-Matic to today's more sophisticated device that features upward of 400 buttons and issues commands to other devices and options the average person doesn't understand or care.

My large LCD flat screen sits there silently waiting. There are no dials or buttons around its periphery. The remote doesn't communicate with it. The remote talks to the cable box. The box talks to the screen. The DVD player can join in if it likes. The land phone, the high-speed Internet, Mr. Coffee, and numerous digital relatives of the "i" family are all "bundled" together like members of the Donner Party on a cold night. The remote, in a fit of pique, hides under the sofa cushions, refusing to come out until supplied with fresh AAs. Sometimes all units talk at once, including my wife. She says, "What else is on?" Small wonder the expression "Life used to be simpler" is heard from 99 percent of the populace trying to nap at major intersections and occupied public parks.

Skeletal musculature relaxed and in some cases disappeared altogether except for those few called into action in delivering carbohydrates to the mouth. The couch potato was born.

He who has the remote in hand knows possession is nine points of the law, but is also obliged to scroll through the first 50 channels, none of which — even those with an English audio — are mutually acceptable. I surrender the remote to my spouse. Of the hundreds of channels available, only about five stand a chance of capturing the attention of both of us, but they have to be checked out regardless. The popcorn is growing cold, the pause button has been activated enough times during potty breaks to make a 90-minute movie that normally takes up three hours with commercials every 11 minutes to verge on four hours. It's going to be a long night.

I finally find a channel I fancy. There are no talking heads, only things that are blowing up or crashing into each other during interminable left-hand circuits of oval race tracks. People with sticks are skillfully placing balls into cups, hoops, or outfields. My wife has found her acceptable channel, stumbling upon a movie that is well into its second hour, but she has instantly divined the plot and will be able to understand everything that develops later. Impasse.

One compromise would be two remotes that would result in a dueling channel encounter rivaling that of the laser swords in the Star War series. Chances are that I would get hurt. The ultimate answer, of course, is two TVs. They would have to be identical to avoid arguments and one could not be sited in the bedroom where the movie-watcher's choice would drone on until midnight, the audio requiring an adjustment loud enough to be heard in the next block to offset the nonwatcher's snoring.

From all accounts, Eugene Polley was a pretty smart man. What bothers me most, I guess, is the irony. He had to wait for 57 years before a relatively small number of the people in the world learned of his existence and how his invention changed our lives forever.

Meanwhile a 20-year-old kid invents Facebook and 45 billion souls from Greenland to remote villages in Zimbabwe know his first name, who he married, and are glued to his project 24/7. Who knew? ■■■■

CDA JOURNAL, VOL 40, Nº11

Inventor Saw Possibilities Were Remote

The remote, in a fit of pique, hides under the sofa cushions, refusing to come out until supplied with fresh AAs.

Robert E. Horseman, DDS

ILLUSTRATION BY VAL B. MINA

Eugene Polley died Sunday of natural causes at his home in Downers Grove, Ill. He was 96 years old.

— CNN, MAY 22, 2012

To anyone who was age 3 or older in 1955, this death notice should cause a sobering reflection. If you have a TV remote in your hand at this moment—any of the three or four you own should do — I would respectfully ask that you push the pause button briefly in honor of Mr. Polley. Or at least the mute button. Better yet, the off button.

Difficult as it is to imagine for those under the age of 55, there was a time when the only way to change the dozen channels of primitive television sets of the very early '50s was to manually turn a dial on the front of the set after it had kindled enough warmth to display the test pattern or Milton Berle, whichever was considered least annoying.

TV manufacturers had all agreed that the proper viewing distance, even for the bright dot in the center of the 12-inch screen, was to be four feet longer than an outstretched channel-changer hand could reach. This necessitated a designated changer to rise from his or

CONTINUES ON 897

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