

Journal

CALIFORNIA DENTAL ASSOCIATION



September 2014

Interprofessional
Education

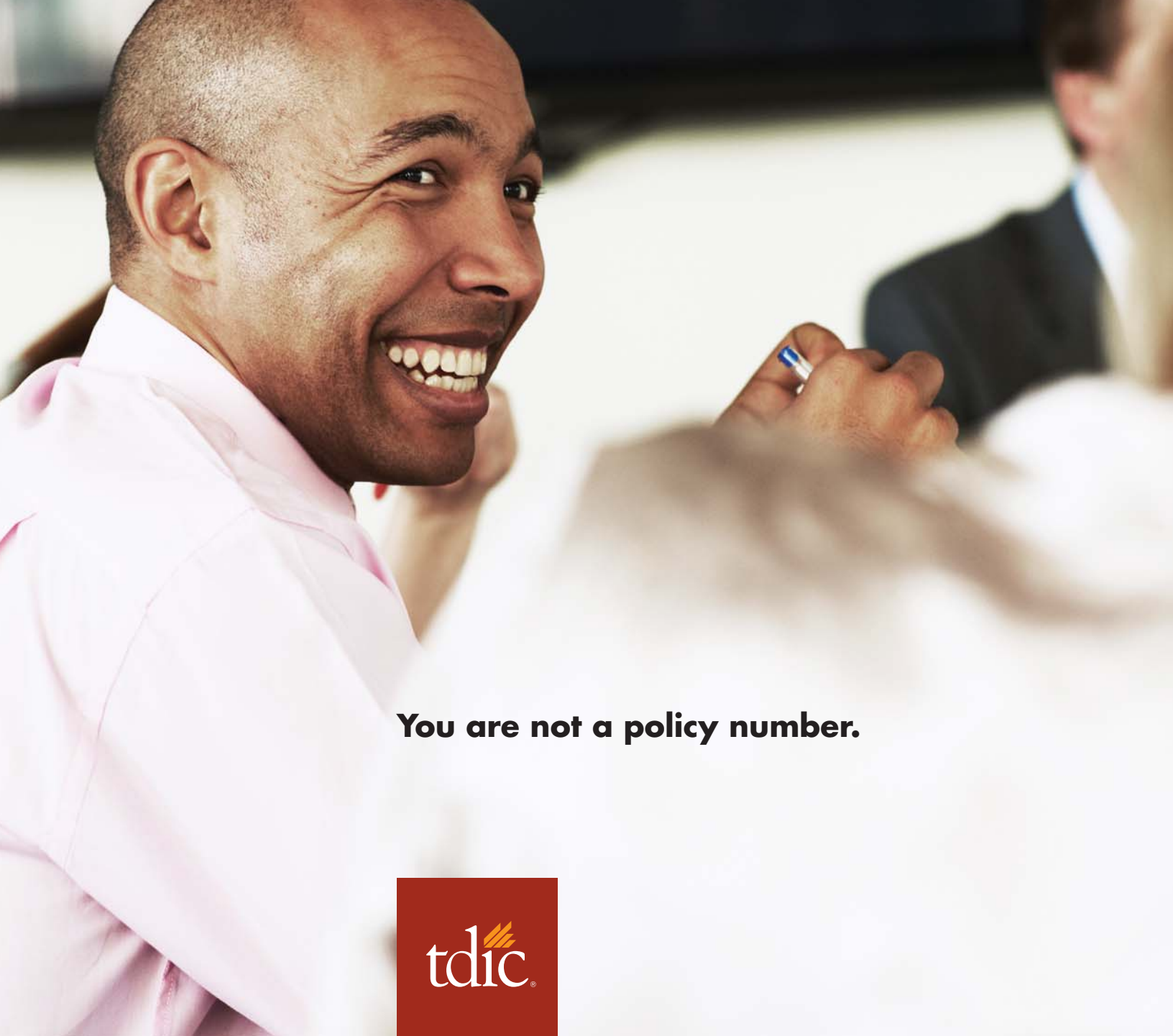
Interprofessional
Health Care Model

Health Outcomes in the
Era of Accountability



Part Two
INTERPROFESSIONAL
EDUCATION AND PRACTICE ...
MOVING TOWARD
COLLABORATIVE,
PATIENT-CENTERED CARE

Lindsey A. Robinson, DDS, and
David M. Krol, MD, MPH, FAAP



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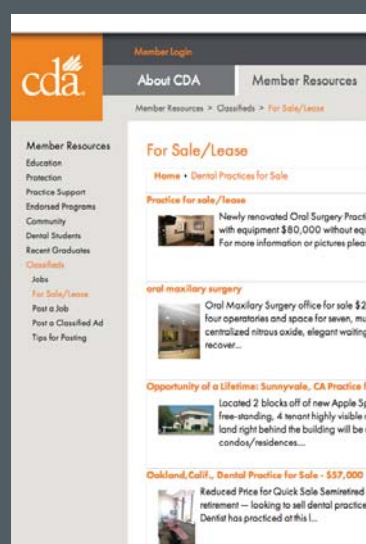
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Editor's Note: California is often at the forefront of many issues, sometimes because it wants to be and sometimes just because. Social issues, economic issues, energy and water issues, environmental protection — the list goes on. In our world of dentistry, the landscape has been changing for a while as many dentists, for many reasons, are considering the option of practicing in a corporate group practice with several of their colleagues, a practice managed by a dental management organization or an insurer-provider group practice like Kaiser. Some are young and just starting, some are mid-career and looking for a better work-life balance and some just want to practice a little without the headaches of managing their practice and all that goes with it.

In Oregon, Kaiser has recently established itself as a prominent player in the mix of dental care providers. In the Portland area, Kaiser has 17 offices that offer dental services and has hired 140 dentists: 105 general dentists and 35 specialists. Kaiser has 40 percent of the commercial health insurance market in California. If it enters the California dental care market, it could have a substantial impact on our profession.

Dr. Taylor is the editor of the Oregon Dental Association. His recent editorial in ODA's *Membership Matters* clearly articulates the questions we need to think about in our changing world of dental practice models. Do we pass judgment on our colleagues for choosing a nontraditional model of practice? Are our motivations to provide the best care possible to our patients and maintain a thriving practice the same? What types of support and services will dentists in these new practice models need from organized dentistry?

— Kerry K. Carney, DDS, CDE



There still persists an attitude among many members that private practice is the only — or optimal — way to provide dental care.

If the ADA tripartite system wants to increase membership, then current members must change their attitudes towards corporate dentistry. The stereotype of an ADA member is a dentist working in a solo private office that accepts only indemnity insurance plans and cash. It is fair to say that this has long been heralded as the ideal practice model, and we should go to great lengths to protect it.

Over the years, the leadership of organized dentistry has reached out to doctors in other practice models, but there still persists an attitude among many members that private practice is the only — or optimal — way to provide dental care. There is a stigma within organized dentistry against the dentist who works in any setting outside of this narrowly defined ideal. This attitude may unfairly alienate a growing number of providers who work in corporate settings, yet these dentists have the same concerns for patient care as dentists in solo practice.

Ironically, many solo practitioners' offices are corporations unto themselves. But when the term "corporate dentistry" is applied to a group of offices with a common brand name, the attitude shifts. Critics claim these offices care too much about making money. How many practice models *aren't* concerned about the bottom line? Who among us can afford

to work without earning an income?

The need to make money starts in dental school where student clinic revenue funds school operating expenses. From there, the majority of dental practices provide dental services that are billed out as individual procedures for reimbursement to the doctor. DMOs that don't bill out for individual services still manage their patient pool to make a profit. It is naïve to think that dentistry would be immune to the economic and social forces that are influencing health care providers to "bend the cost curve," a phrase eloquently used by a colleague recently. Every practice model will be affected by changing economic conditions.

ODA executive director, Conor McNulty, recently presented a report on corporate offices to the ODA Board of Trustees. The number of offices in large group practices increased 25 percent between 2009 and 2011, in the 25 practices surveyed.

In Oregon, Gentle Dental now has 28 offices, Aspen Dental has nine and Pacific Dental Services has seven. These are just a few examples of corporate dental offices that provide services in an economic model similar to solo offices. These are different than DMO models like Willamette Dental Group or Kaiser Permanente.

When *Inc. Magazine* recently named

businesses that are creating jobs across the nation, two of the top 10 were dental care companies. Pacific Dental Services came in at number four and Heartland Dental Care at number six. In the health care sector, four of the top 10 companies adding new jobs were providers of dental care.

Many of these new hires obviously are dentists with many of the same concerns and priorities as any other ADA tripartite member. They want to provide great care for their patients; they want to earn an income; and they are as interested in new technology as doctors in private practices. It is also in their best interests that dentists remain the leaders of dental teams. Due to economies of scale, these companies are able to provide many of the

member benefits that organized dentistry traditionally provided to its members.

ADA tripartite members need to recognize the commonalities between corporate and solo dental practices. Viewing corporate providers as somehow lesser than other providers will only further discourage their involvement in organized dentistry, and, from that, there is nothing to be gained. ■

Reprinted with permission. This editorial first appeared in the May 2014 issue of the Oregon Dental Association's Membership Matters magazine. Dr. Taylor is editor of Membership Matters. He can be reached at barrytaylor1016@gmail.com. The opinions expressed in this editorial are solely the author's own.

The Journal welcomes letters

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The Short End of the Stick

David W. Chambers, EdM, MBA, PhD

Among the meaningless things people say with a completely straight face, my favorite is “getting the short end of the stick.” Imagine a stick: it might have a thin end or a near end, but it cannot have a short end.

Now let’s apply this to good dentistry and good oral health. These good things are not quite equivalent. Some patients are overtreated with technically excellent care. Some patients in excellent health receive no dental treatment at all. Of course, good oral health and good dental treatment go together, but not perfectly. And it may not always be certain in which direction the causal arrow is pointing. It may be that people with basically sound oral health are more likely to go to the dentist than that dentists can get all their patients to brush and floss.

Through the American College of Dentists, I recently presented eight ethics cases to about 80 dentists (officers in the college) and 40 “patients” (members of a local church). Both groups were asked to state how important various ethical considerations were and how appropriate certain dentist actions would be. It should not come as a surprise that there was a range of responses. The good news is that patients and dentists want roughly the same things. These cases can be seen at dentaethics.org in the IDEA section.

But 80 or more data points (eight cases and 10 rating items) is a bit much to remember. So I asked a computer I know to search for trends. The pattern was clear. Patients and dentists focus on two characteristics in common: First is treating people with respect, honoring the individual. Second is quality dental treatment.

The clunker in the research was that patients were looking for something in addition that dentists did not seem to notice. Oral health outcomes — patients being brought to and maintained at a high level of function, appearance and freedom from disease — showed up as a core value only for the patients. Naturally, dentists might have assumed this, although they did not assume technique excellence. This is the short-end-of-the-stick problem. If oral health is the ultimate end and technically appropriate treatment is the means, why were the means mentioned and not the end? There are other ways to achieve the goal of sound oral health by way of prevention and access that do not involve dentists in the same way that treatment acumen does. Has the profession allowed itself — with the help of industry, C.E. and P.R. firms — to be defined by technique rather than impact? Does the profession use a different standard to define success than the public does? ■

The nub:

1. It is unlikely that dentistry will have exclusive say in how oral health is valued.
2. The recent five-year trend in lower dentist net income and lower use of dental services by the public are likely correlated.
3. Heavy focus on the means may obscure the ends.

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



Dental Calculus From Ancient Human Teeth Gives Insight Into Diet

In a new study, researchers extracted and chemically analyzed compounds and microfossils from dental calculus samples of 14 individuals from the pre-Mesolithic, Neolithic and Later Meroitic age. According to a description of the study, published in the journal *PLOS ONE*, the authors found that humans ingested purple nut sedge for at least 7,000 years, during both pre-agricultural and agricultural periods.

"The extraction of chemical compounds and microfossils from dental calculus removed from ancient teeth offers an entirely new perspective on dietary reconstruction, as it provides empirical results on material that is already in the mouth," the authors wrote.

The study found that the purple nut sedge plant, which is a good source of carbohydrates with potential medicinal and aromatic qualities, formed an important part of the prehistoric diet and, with the ability to inhibit a certain type of *Streptococcus*, may explain the unexpectedly low level of cavities found in the population.

"By extracting material from samples

Poor Oral Health Among Navajo

A new study has discovered that poor oral health remains a major problem in the Navajo Nation and among American Indians overall. The study assessed oral health status for preschool-aged children in the Navajo Nation to obtain data on baseline decayed, missing and filled tooth surfaces and dental caries patterns, the authors wrote.

The study, published in the *Journal of Public Health Dentistry*, looked at 981 children in 52 Head Start classrooms on the reservation and discovered that of those, 89.3 percent had oral disease in the past and 69.5 percent had untreated tooth decay, compared with 20.48 percent among all other race and ethnic groups.

"The oral health among Native Americans is abysmal with more than three times the disease of the rest of the country," said Terrence Batliner, DDS, MBA, associate director of the Center for Native Oral Health Research at the School of Public Health, in a news release.

"The percentage of children with untreated decay appears to have declined in the past decade, although it remains today substantially higher (three to four times) than national averages," the authors wrote. The study also found that half of all Native American children need to be treated in the operating room due to the severity of their oral disease.

For more information, see the study published online in the *Journal of Public Health Dentistry*, June 23, 2014.



of ancient dental calculus, we have found that rather than being a nuisance in the past, the purple nut sedge's value as a food, and possibly its abundant medicinal qualities, were known," said lead author Karen Hardy in a news release. "We also discovered that these people ate several other plants, and we found traces of smoke, evidence for cooking, and for chewing plant fibers to prepare raw materials. These small biographical details add to the growing evidence that prehistoric people had a detailed understanding of plants long before the development of agriculture."

"The development of studies on

chemical compounds and microfossils extracted from dental calculus will help to counterbalance the dominant focus on meat and protein that has been a feature of pre-agricultural dietary interpretation, up until now. The new access to plants ingested, which is provided by dental calculus analysis, will increase, if not revolutionize, the perception of ecological knowledge and use of plants among earlier prehistoric and pre-agrarian populations," said Hardy.

For more information, see the study published online July 16, 2014, in *PLOS ONE*.

Oral Cancer's Aggressiveness Found to Be Predictable

Studying mouth cancer in mice, researchers at Washington University School of Medicine have discovered a way to predict the aggressiveness of similar tumors in people, according to a news release. Calling this an early step toward a diagnostic test that could guide treatment, the findings are published in the journal *Clinical Cancer Research*.

The researchers found “a consistent pattern of gene expression associated with tumor spreading in mice,” and, through analysis of genetic data from

human oral cancer samples, also found this gene signature in people with aggressive metastatic tumors.

For this study, the investigators repeatedly applied a known carcinogen, similar to the way humans develop cancer of the mouth. By doing so, the researchers saw the exposure sometimes resulted in tumors that did not metastasize but others resulted in aggressive metastatic tumors.

“Patients often have a history of tobacco and alcohol use, which drive the development of these tumors,” said



Dental Pulp Stem Cells May Protect Retinal Cells

Researchers at the University of Birmingham reported in the journal *Neural Regeneration Research* that dental pulp stem cells, stem cells isolated from the teeth, could help protect retinal ganglion cells (RGCs) from death following injury and promote regeneration of their axons along the optic nerve.

According to a news release from the university, RGC loss is the leading cause of blindness and can arise through traumatic injury or degenerative diseases like glaucoma. Neurotrophic factors (NTFs) promote survival of injured RGCs and regeneration of their axons, suggesting their clinical utility to prevent further damage and restore lost function, the authors wrote in the study. Supplementation of injured RGC with an alternative source of NTFs is paramount to protecting them from death.

The study confirmed that dental pulp stem cells naturally express multiple NTFs that can supplement the lost supply of NTFs and protect RGCs from death as well as promote regeneration of their axons.

“Cell therapy is a promising treatment option as it provides a potentially limitless source of multiple growth factors for injured neurons,” said first author Ben Mead. “For clinical application, comparisons with other stem cells as well as development of safe delivery mechanisms are to be investigated in the future.”

For more information, see the study “Dental pulp stem cells, a paracrine-mediated therapy for the retina” in *Neural Regeneration Research*, 2014, vol. 9, issue 6, pp. 577-578.



Ravindra Uppaluri, MD, PhD, an associate professor of otolaryngology, in the news release. “We felt that exposing the mice to a carcinogen would be more likely to produce similar kinds of tumors.”

To find out whether the mouse and human tumors also were genetically similar, the team compared their mouse sequences to human data sets from The Cancer Genome Atlas (TCGA) and found a number of the genetic mutations present in the mouse tumors also were found in human head and neck cancers, Uppaluri said.

Further analysis identified a common signature in the expression of about 120 genes that was associated with the more aggressive tumors, in mice or people. The researchers confirmed this signature and, using oral cancer samples from patients treated at Washington University, developed a proof of concept test from their signature that identified the aggressive tumors with 93.5 percent accuracy.

For more information, see the study in *Clinical Cancer Research*, vol. 20:11, pp. 2873-2884.



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Study: Public Knowledge of Head and Neck Cancers

In a cross-sectional survey aimed to assess the public's awareness and knowledge of head and neck cancers, researchers found that American adults may know little about these cancers, including common symptoms and risk factors such as tobacco and human papillomavirus infection.

Through an online survey of randomly selected adults in the United States, conducted in 2013, the study measured subjective and objective assessment of personal knowledge of head and neck cancers. Self-reported knowledge of head and neck cancers was low with 66 percent of respondents reporting that they were "not very" or "not at all" knowledgeable, according to the study.

As for knowledge of risk

factors, smoking and chewing or spitting tobacco were identified by 54.5 percent and 32.7 percent of respondents as risk factors for mouth and throat cancer, respectively. Only 0.8 percent of respondents identified HPV infection as a risk factor for mouth and throat cancer, but specific questioning found that 12.8 percent were aware of the association between HPV infection and throat cancer.

Regarding sites comprising head and neck cancers, 22.1 percent of respondents correctly identified throat

cancer, 15.3 percent mouth cancer and 2 percent cancer of the larynx, while 21 percent incorrectly identified brain cancer as head and neck cancer, the authors reported. They concluded, "Strategies to improve public awareness and knowledge of signs, symptoms and risk factors may decrease the disease burden of head and neck cancers and are important topics for future research."

For more information, see the study in *JAMA Otolaryngology — Head & Neck Surgery*, 2014, vol. 140, no. 7, pp. 639-646.

Researcher Uses Microscopic Particles to Deliver Medication Into Teeth

Treating pain caused by pulpitis, or an inflammation of the dental pulp deep within the tooth, typically requires a root canal procedure to remove the damaged pulp, but new research from the University of Maryland School of Dentistry (UMSOD) could provide dental practitioners with a much less invasive treatment for pulpitis, according to a news release from the school. Radi Masri, DDS, PhD, MS, is working to develop a new, patent-pending technique to deliver medication directly into the center of a tooth.

With a grant from the National Institute of Dental and Craniofacial Research (NIDCR), Masri and a collaborator are conducting the study using strong magnetic fields to move microscopic particles through the tooth's dentin and into the pulp.

The researchers are utilizing the tubules as a vehicle to deliver medication that could reduce inflammation or treat infection by attaching medication to microscopic balls known as nanoparticles, the news release explains. By creating the nanoparticles out of a magnetic substance, like iron, the researchers can use a magnetic field to push those particles, and the attached medication, through the tubules and into the pulp.

The researchers designed "a system of magnetic arrays that are effective for upper or lower teeth. By manipulating a series of cube-shaped magnets, they can control the magnetic field so the nanoparticles are pulled through the tubules into the tooth pulp." The research has shown that, even though the nanoparticles are tiny, they are able to deliver a large enough dose for medications to be effective.

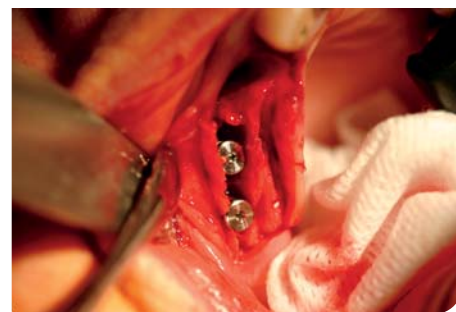
For more information, see the news release at www.oea.umaryland.edu/communications/news/?ViewStatus=FullArticle&articleDetail=23004.

Graft Techniques: Ridge-split Versus Block Bone

The *Journal of Oral Implantology* recently published an article evaluating graft techniques for the alveolar ridge prior to oral implant. The article compares the ridge-split and the block bone techniques. According to the article, the oral surgeon must decide which technique is best for bone augmentation based on an assessment of the patient's condition and the oral

surgeon's own skills and experience.

The author explains that alveolar bone should be initially assessed clinically (visually) for a rough width and height analysis and interarch-occlusal relationships. Radiographic images can distinguish 2-D versus 3-D bone deficiency. A 3-D or volumetric bone evaluation with cone beam computed tomography allows for precise



Intraoperative photograph of the ridge-split procedure that is done simultaneously with the implant insertion. (Image courtesy of Len Tolstunov, DDS, DMD, and the *Journal of Oral Implantology*/Allen Press Publishing Services.)

FDA: Safety Advisory for Multi-use Dental Dispensers

The U.S. Food and Drug Administration recently issued a safety advisory regarding multiple-use dental dispensers, also called dental syringes, which are used to deliver various dental products, including adhesives, dental composites and endodontic materials. Multiple-use dental dispensers do not include disposable syringes or hypodermic syringes for injection of anesthetics.

The FDA said on its website that manufacturers typically supply multiple-use dental dispensers as prefilled syringes with disposable tips. The agency noted that the intent is for the tips to be discarded after each patient use while the dispensers containing the remaining dental material can be stored for reuse.

"Contamination or infection control issues arise for future patients when the body or housing of multiple-use dental dispensers comes in contact with a previous patient's cheek or lips, or when the dispenser is handled by a dental practitioner whose gloves have become contaminated with previous patient's blood or saliva," the FDA wrote in the advisory, which also includes a list of do's and don'ts for dental practitioners.

Multiple-use dental dispensers cannot be reprocessed using sterilization, such as a steam autoclave, or immersion because this may damage the material contained in the dispensers. According to its website, the FDA does not believe multiple-use dental dispensers, once contaminated, can be adequately disinfected by wiping with a chemical disinfecting solution and recommends applying disposable barrier sleeves/wraps over these dispensers before use with each patient.

For more information and to read the safety tips, visit www.fda.gov/MedicalDevices/ProductsandMedicalProceduresDentalProducts/ucm404472.htm.

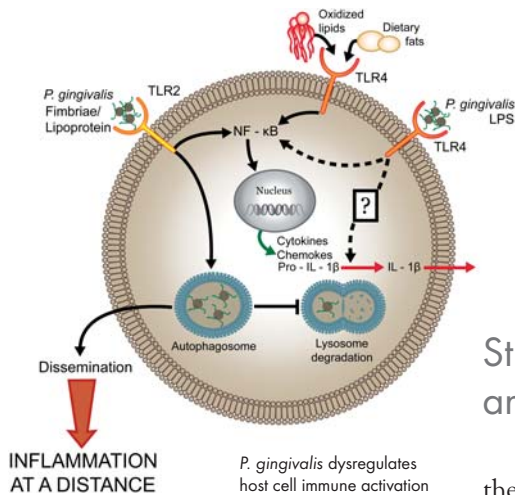


measurement of the ridge and evaluation of both the cortical and medullary portion of the bone, which are imperative for the stability of the implant, according to a news release describing the article.

Also included is a 10-point comparison of the ridge-split and block bone techniques and the author explains that both methods are used primarily for horizontal alveolar ridge augmentation, or bone widening. Block bone grafting is effective for severe anterior atrophy in the upper and lower jaw. However, the author notes that morbidity at the donor site and later-term graft resorption can occur with this method.

"The ridge-split approach tends to have many advantages, including lack of donor site morbidity and a graft stability over time," the article states, concluding that "operator experience and surgical comfort ultimately determines the choice of the technique."

For more information on these techniques, see the article, "Classification of the Alveolar Ridge Width: Implant Driven Treatment Considerations for the Horizontally Deficient Alveolar Ridges," published in the *Journal of Oral Implantology*, vol. 40, special issue 1, 2014.



P. gingivalis dysregulates host cell immune activation facilitating systemic inflammation. (Image courtesy of Slocum C, Coats SR, Hua N, Kramer C, Papadopoulos G, et al. (2014) Distinct Lipid A Moieties Contribute to Pathogen-Induced Site-Specific Vascular Inflammation. *PLoS Pathog* 10(7): e1004215.)

Study Explores Association Between Periodontitis and Atherosclerosis

Chronic oral infection with the periodontal disease pathogen *Porphyromonas gingivalis* not only causes local inflammation of the gums leading to tooth loss but also is associated with an increased risk of atherosclerosis — hardening and narrowing of the arteries. According to a recent study published in *PLOS Pathogens*, researchers have discovered how the pathogen evades the immune system to induce inflammation beyond the oral cavity.

According to a description of the study, the research team focused on the role of a specific lipid expressed on the outer surface of *P. gingivalis*, called lipid A, which is known to interact with a key regulator of the host's immune system called TLR4. *P. gingivalis* can produce a number of different lipid A versions, and the researchers set out to clarify how these modify the immune response and contribute to the ability of the pathogen to survive and cause inflammation — both locally, resulting in oral bone loss, and systemically, in distant blood vessels.

“To determine if the expression of modified lipid A by *P. gingivalis* is associated with the ability of the organism to promote chronic inflammation in vivo, we utilized a mouse model that mimics chronic *P. gingivalis* exposure as seen during human infection,” the authors wrote.

They reported in the study that they found “infection with *P. gingivalis* induced low levels of proinflammatory mediators but accelerated chronic inflammatory atherosclerosis.”

In contrast, the ability of *P. gingivalis* to induce local inflammatory bone loss was independent of lipid A variations, which demonstrates that there are distinct mechanisms for induction of local versus systemic inflammation.

The authors conclude, “Our work demonstrates that evasion of immune detection at TLR4 contributes to pathogen persistence and facilitates low-grade chronic inflammation.”

For more details, see the study published July 10, 2014, in *PLOS Pathogens*.

Oral Cancer Location Varies With Patient Age

Researchers recently conducted a study to determine whether variations based on the age of a patient exist in the features of oral squamous cell carcinoma, including the site of the oral cancer.

In the study, published in the *Journal of Oral and Maxillofacial Surgery*, authors analyzed clinicopathologic parameters of oral squamous cell carcinoma (OSCC) in different age groups by examining the records of 739 patients treated at a single institution from 2001 to 2012. Of these, 45 patients met the inclusion criteria and were separated into three age groups: 11 were “young” patients (under age 40), 17 “middle-aged” patients (from 40 to 80 years of age) and 17 “very elderly” patients (over age 80).

The authors reported that among the young patients, 63 percent of the cancers occurred on the tongue; in the middle-aged group, 52 percent were found under the tongue; and in the very elderly patients, 60 percent occurred on the gum tissue around tooth sockets.

Specifically, the researchers considered the location of the cancer, patient exposure to risk factors such as smoking and alcohol consumption, and possible association of the cancer with the human papilloma virus (HPV).

The authors concluded that “the features of OSCC that vary at different ages are the anatomic predilection site and the association with classic risk factors,” and noted that in this study, “HPV was not an age-related independent risk factor for OSCC development.”

For more information, see the full study in the *Journal of Oral and Maxillofacial Surgery*, 2014, vol. 72, issue 7, pp. 1291-1300.



Image: Michael T. Brennan, DDS, MHS



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Winners of the 2014 Table Clinic Competition

The California Dental Association encourages dental, dental hygiene, dental assisting students and military/residents from across the state to enter the annual Table Clinic Competition held during *CDA Presents* in Anaheim. Blue-ribbon winners from the May 16–17 contests were invited to submit abstracts of their work, which appear in this section. CDA collaborated with the California Dental Hygienists' Association for the RDH portion of the table clinics.

CLINICAL DENTAL STUDENT WINNERS

Left to right: Rachelle Kim, Yvette Carrillo and Jillian LeBard



Effects of OnPharma on the pH of Local Anesthetics

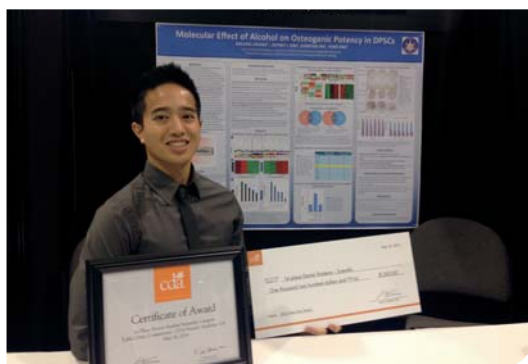
Rachelle Kim, Jillian LeBard and Yvette Carrillo, Loma Linda University School of Dentistry

Commercial local anesthetic solutions are prepared as acidic salts to help promote solubility and to prolong shelf life. Adding epinephrine to the solution drops the pH even lower, to an acidity ranging from 3.3 to 5.5. This may contribute to the stinging pain upon injection and prolong the rate of onset. When a local anesthetic solution penetrates the nerve membrane to enter the nerve axon, it exerts its electrophysiological effects by blocking sodium ion conductance, which is dependent on the availability of deionized

or lipid-soluble drug molecules. The lipid solubility of a local anesthetic affects its tissue penetration and uptake in the nerve membrane because it interacts with a specific protein molecule in the lipid bilayer of nerve membranes. Although the ionized form is the pharmacologically active form, the body has to buffer the local anesthetic toward the physiologic pH to increase the ability of the deionized anesthetic to cross the nerve membrane first for effective analgesia. Preparing a local anesthetic as a freely diffusible form at a higher pH before injection can potentiate the action of the local anesthetic because the drug molecules can more effectively penetrate the nerve membrane, hypothetically providing the patient with a more comfortable injection and a faster rate of onset. The purpose of this research study was to determine the efficacy and buffering capabilities of a product on the market called OnPharma or Onset. We hypothesized that various formulations of local anesthetic solutions buffered with this sodium bicarbonate buffering system would show a significant difference in pH that is equal to physiologic pH or a pH of 7.365.

THE CORRESPONDING AUTHOR, Rachelle Kim, can be reached at rakim@llu.edu.

SCIENTIFIC DENTAL STUDENT WINNER (TIE)



Molecular Effect of Alcohol on Osteogenic Potency in DPSCs

Michael Hoang, University of California, Los Angeles, School of Dentistry

Dental pulp stem cells (DPSCs) are proliferative, multipotent adult stem cells that can be affected by stressful extrinsic environments, such as that induced by ethanol. Due to reactive aldehyde byproducts, ethanol exposure leads to changes in DNA and proteins within cells that result in mutagenesis and cell

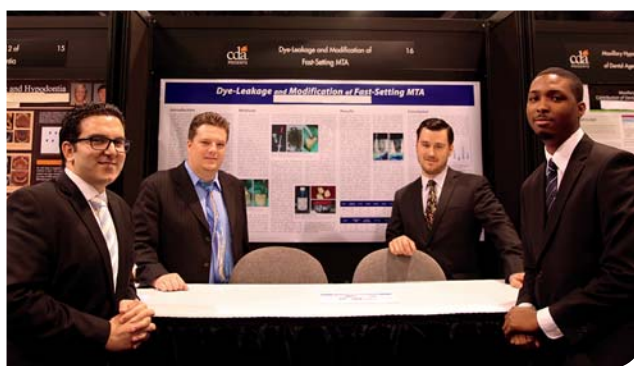
death. Ethanol has been shown to induce the hypermethylation of cell cycle genes and to increase expression of DNA methyltransferases in neural stem cells, which affect growth factor signaling and down regulation of associated mRNAs and cell cycle proteins. I hypothesized that genome-wide epigenetic changes, such as alteration of DNA methylation patterns due to ethanol exposure, have detrimental effects on the potency of DPSCs. Early-passage DPSCs were isolated from

deciduous teeth and subjected to acute and chronic exposure treatments. Results were determined through use of transcriptomic, DNA methylation array, bioinformatics and RT-PCR array analysis. Ethanol (EtOH) treatment led to transcriptomic changes in DPSC genes in a dosage-dependent manner and global DNA methylation changes. A combined analysis revealed a correlation between dysregulation of gene expression and epigenetic changes. I identified KDM6B, histone lysine demethylase, one of the epigenetic modifiers involved in odontogenic differentiation of mesenchymal stem cells, as significantly deregulated by EtOH treatment. Further analysis showed that EtOH treatment substantially reduced osteogenic differentiation of DPSCs with dysregulation of osteogenic marker expression. It has been previously demonstrated that KDM6B regulates odontogenic differentiation via regulation of bone morphogenetic proteins (BMP).

THE AUTHOR, Michael Hoang, can be reached at michaelthoang@gmail.com.

SCIENTIFIC DENTAL STUDENT WINNERS (TIE)

Left to right: Sepehr Nassiripour, Ryan Becker, Jason Lane and Hereward Challenger



Dye Leakage and Modification of Fast-setting MTA

Hereward Challenger, Ryan Becker, Jason Lane and Sepehr Nassiripour, Loma Linda University School of Dentistry

Purpose: The objective of this investigation was twofold: to determine the dye leakage of fast-setting mineral trioxide aggregate (FSMTA) and to decrease dye leakage of FSMTA by adding various concentrations of calcium sulfate.

Methods: Standardized root-end preparations (n =110) were randomly assigned to two experimental groups. One group used FSMTA at different setting times while the other group utilized various concentrations of calcium sulfate modified FSMTA. After samples were placed in a dye bath for 24 hours, specimens were assessed for dye penetration and statistical analysis was performed using the Kruskal-Wallis procedure.

Conclusion: Based on the results of this study, no difference was found in the leakage of FSMTA compared with regular MTA. The addition of 10% calcium sulfate to FSMTA results in a statistical reduction in dye leakage of this material compared to unmodified FSMTA, as well as a reduction in dye leakage compared with regular MTA.

THE CORRESPONDING AUTHOR, Hereward Challenger, can be reached at hchallenger@llu.edu.

COMMUNITY/EDUCATION DENTAL STUDENT WINNER



ASDA Community Clinics

Ryan Brennan, University of California, Los Angeles, School of Dentistry

In 2013, the American Student Dental Association (ASDA) Community Clinics were inaugurated at two locations, Meet Each Need with Dignity

(MEND) and Homeless Not Toothless. At these clinics, dental students, under the supervision of faculty members, provided free dental services to the homeless and people who were below the poverty line. Each of these clinics operated one Saturday a month. During the first 10 months, dental students saw more than 225 patients and provided roughly 500 dental procedures to those in need. Through the ASDA Community Service Committee chair, this project will continue indefinitely. This presentation discusses the establishment of the project, obstacles encountered and the impact it is having on the communities we are serving and the students who participate.

THE AUTHOR, Ryan Brennan can be reached at r.brennan@ucla.edu.

RDA STUDENT WINNER



Snoring (Problematic Sleeping and Dentistry)

Eric Johnston, Hart District ROP

Snoring and dentistry appear to be two unrelated subjects. However, with clear understanding of the causes, which are relatively simple to grasp, and the mitigation efforts, which can be quite complicated, the two are quickly recognized as being directly related. As a curious dental assistant, I wished to fully investigate problematic sleeping and dentistry. Through my research, I discovered that snoring was not the largest issue, but upper airway resistance syndrome (UARS) and obstructive sleep apnea (OSA) were. During my presentation, I covered three main topics in depth. I engaged in two experiments, one with a live subject and the other with a device I created to simulate the response of an obstructed airway. I concluded that the implementation of oral dental appliances is a necessary component in the treatment of patients diagnosed with snoring, UARS and OSA.

THE AUTHOR, Eric Johnston, can be reached at ericj96@sbcglobal.net.



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Dates: Friday - Saturday, October 17 -18, 2014

Location: USC Davidson Continuing Education Conference Center, Los Angeles, CA

PEDIATRIC ORAL SEDATION CERTIFICATION PROGRAM

CA Board Approved Program

Lecture, Hands-On SIM-MAN Workshop, PALS

Faculty: Dr. Stanley Malamed, Dr. Ken Reed, Dr. Rick Ritt, Mr. Charles Coleman, and Ms. Rose Dodson

Dates: Wednesday - Sunday, October 29 - November 2, 2014

Location: Herman Ostrow School of Dentistry of USC, Los Angeles, CA

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Clinical and Biological Concepts of Modern Endodontics

Speakers: Dr. James Kulild, Dr. C. John Munce, Dr. Markus Haapasalo, Dr. Stephen P. Niemczyk, Dr. Aviad Tamse, Dr. Stanley Malamed, Dr. Jean-Yves Cochet, Dr. Bruno C. Azevedo, Dr. Ilan Rotstein (Symposium Chair)

Dates: Friday - Saturday, November 21 - 22, 2014

Location: USC Davidson Continuing Education Conference Center, Los Angeles, CA

THE 40TH ANNUAL USC INTERNATIONAL PERIODONTAL AND IMPLANT SYMPOSIUM

Myth-Busters: Dispelling Common Myths in Clinical Practice

Speakers: Dr. Stefan Bughi, Dr. George Cho, Dr. Christopher Church, Dr. Marco Esposito, Dr. William Giannobile, Dr. Christoph Hammerle, Dr. Thomas Han, Dr. Michael Hirt, Dr. Arash Khojasteh, Dr. Alina Krivitsky-Aalam, Dr. Sophia Petrov, Dr. Senichi Suzuki, Dr. Dimitri Tatakis, Dr. Homlay Wang, Dr. Mark Urata, Dr. Istvan Urban, Dr. Homa Zadeh (Symposium Chair)

Dates: Friday - Saturday, January 23 - 24, 2015

Location: Millennium Biltmore Hotel, Los Angeles, CA

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Faculty: Dr. Stanley Malamed, Dr. Ken Reed

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PHYSICAL EVALUATION*

Dates: Monday, April 27, 2015

EMERGENCY MEDICINE*

Dates: Tuesday, April 28, 2015

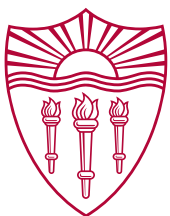
MONITORING AND SIM-MAN*

Dates: Wednesday, April 29, 2015

PHARMACOLOGY*

Dates: Thursday, April 30, 2015

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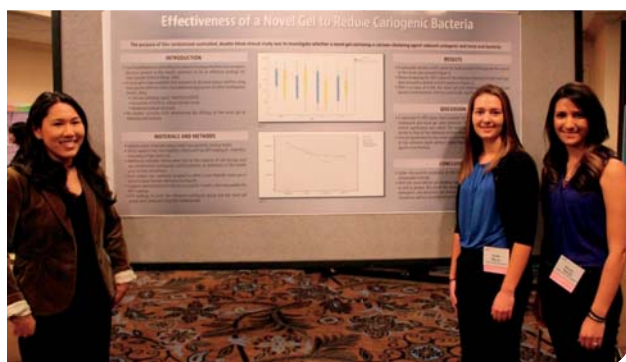
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 Southern California

RDH RESEARCH STUDENT WINNERS (CDA IN COLLABORATION WITH CDHA)



Left to right: Tiffany Setiono, Kelli Mertz and Kayla Marin

Effectiveness of a Novel Gel to Reduce Cariogenic Bacteria

Tiffany Setiono, Kelli Mertz, Kayla Marin, Loma Linda University School of Dentistry

Background: The purpose of this randomized-controlled, double-blind clinical study was to investigate whether a novel gel containing a calcium-chelating agent reduced cariogenic and total oral bacteria.

Methods: Thirty subjects were screened using a caries susceptibility meter and met the eligibility criteria of an adenosine triphosphate (ATP) reading of >1500, indicating high levels of bacteria. Each subject was randomly assigned to either a nonfluoride novel gel or an antimicrobial fluoride reference toothpaste. Investigators were blinded to the assignments. Subjects brushed as usual for three weeks and returned weekly to obtain an ATP reading.

Results: The novel gel and reference paste were comparable and both reduced bacteria from baseline with no statistically significant differences.

Conclusions: Because this novel gel does not depend on abrasive materials, antimicrobials or fluoride, it could change the way we look at mechanisms of plaque biofilm removal and bacterial reduction.

THE CORRESPONDING AUTHOR, Tiffany Setiono, can be reached at tsetiono@llu.edu.

RDH INFORMATIONAL STUDENT WINNERS (CDA IN COLLABORATION WITH CDHA)

Left to right: Rhea Tatarian, Crystal Summers and Janine Campanile



Plumping Up the Options for Periodontal Disease Treatment

Rhea Tatarian, Janine Campanile and Crystal Summers, Cypress College

Background: Hyaluronic acid (HA) is a naturally occurring glycosaminoglycan found in the extracellular matrices

of connective tissue and synovial fluid. HA has been used in medicine for the treatment of osteoarthritis, rheumatoid arthritis, inflammatory conditions of the knee and as soft tissue fillers for cosmetic procedures. In a gel form, several of its biological

characteristics have shown promising healing properties when it is used as an adjunct to scaling and root planing in patients with chronic periodontitis.

Methods: The authors reviewed current information and research from scholarly peer-reviewed journal articles and medical websites.

Results: Research shows that HA may have positive healing effects in patients who have chronic periodontitis in regard to probing depths and quantities of destructive bacteria in periodontal pockets.

Conclusion: Applying HA subgingivally and topically after scaling and root planing may have additive effects on tissue regeneration and may offer an alternative to antibiotic therapy.

THE CORRESPONDING AUTHOR, Rhea Tatarian, can be reached at heatatarian@gmail.com.

MILITARY/RESIDENT WINNER



A Novel Approach to Immediate Implant Placement

Capt. Heather Norton, United States Air Force

Immediate implant placement is gaining popularity in implant dentistry for replacement of nonrestorable teeth. Multirooted molar sites present challenges in osteotomy preparation immediately following extraction. One of the greatest of these challenges is the ability to ideally position the implant. Additionally, large extraction sites and the variable anatomy of interradicular bone septa can cause difficulty in stabilizing the osteotomy drill. This presentation describes a new technique for immediate implant preparation in molar sites that may provide improved drill stability and guidance.

THE AUTHOR, Capt. Heather Norton, can be reached at heather.norton1@us.af.mil.

Judges for the annual table clinics competition at CDA Presents Anaheim

RDA Judges

Tobi Trotta, RDA
 Evangeline Enriquez, RDA
 Benson Dimaranan, RDA
 Melrose Nabua, RDA
 Shari Becker, RDA
 Maria Christina Ochoa, RDA
 Georgie Vargas-Burket, RDA
 Maleah Brooks, RDA
 Jen Blake, FADAA
 Karen Schroeder, RDH

RDH Judges

Howard Richmond, DDS
 Bruce Coyne, DDS

Dental Students/Clinical Judges

Judith Strutz, DDS
 Jaymie Coria, DDS
 Zaw Thu, BDS
 Ramesh Gowda, DDS
 Pradip Patel, DDS

Dental Students/Community Judges

Leonard Raimondo, DDS
 Arnold Valdez, DDS
 Donna Klauser, DDS

Dental Students/Scientific Judges

Oariona Lowe, DDS
 Marileth Coria, DDS
 Sonia Molina, DDS
 Mei Lu, DDS
 Samuel Demirdji, DDS

Military/Resident Judges

Robin Abari, DDS
 Arthur Gage, DDS
 John Safar, DDS
 Nathan Krivitzky, DDS
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Interprofessional Education and Practice ... Moving Toward Collaborative, Patient-centered Care: Part Two

Lindsey A. Robinson, DDS, and David M. Krol, MD, MPH, FAAP

GUEST EDITORS

Lindsey A. Robinson, DDS, is the immediate past-president of the California Dental Association, past chair of the CDA Foundation and represents CDA on the Institute of Medicine Health Literacy Roundtable. She received her dental degree from the Herman Ostrow School of Dentistry of the University of Southern California and a certificate in pediatric dentistry from the University of Florida. Dr. Robinson was a member of the ADA Council on Access, Prevention and Interprofessional Relations for six years and served as vice chair for a year and chair for two years. She is a founding board member of the U.S. National Oral Health Alliance. Dr. Robinson practices in Grass Valley, Calif. *Conflict of Interest* Disclosure: None reported.

David M. Krol, MD, MPH, FAAP, a pediatrician, is a senior program officer of the Robert Wood Johnson Foundation. He serves on the executive committee of the American Academy of Pediatrics (AAP) Section on Oral Health and is on the steering committee of the AAP Oral Health Initiative. Dr. Krol received his master of public health degree from the Mailman School of Public Health at Columbia University, and his medical degree from the Yale School of Medicine. Dr. Krol played professional baseball with the Minnesota Twins. *Conflict of Interest* Disclosure: None reported.

This is the second of three *Journal* issues focusing on interprofessional education (IPE) and practice. This time, pediatric colleagues in medicine and dentistry have collaborated to bring together a group of authors who are national thought leaders on the subject and who are actively involved with promoting the approach in their working environments. Additionally, the authors were presenters at the IPE conference, *Creating a Vision for the Dentist of the Future*, which was co-sponsored by the California Dental Association and American Dental Education Association and convened on Feb. 3-4 in San Francisco. They were part of an illustrious group of speakers who participated in the conference, which marked a symbolic collaborative venture between the dental practice and education communities who came together to identify key drivers and challenges, examine opportunities for greater interprofessional collaboration and

practice, and create a vision for the dentist of the future. Summaries from the panel presentations are included in this issue.

Answering the questions of how and why the interprofessional movement has emerged as a health care imperative requires an understanding of the major forces driving change in the U.S. health care system. They include rapid increases in cost of care, variability in quality produced by our fragmented health care system and existence of health disparities among different populations of people.¹

The Institute of Medicine defines quality as the “degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”² One insightful study published in 2006 highlighted the marked differences across the country in how care is provided relative to existing professional standards. Across the spectrum of acute and chronic care only 55 percent of patients received

recommended care.³ Furthermore, there is great geographic variability in health care spending for similar conditions. In Atul Gawande's landmark 2009 *New Yorker Magazine* article, *The Cost Conundrum*, he compared Medicare expenditures in two Texas towns with similar circumstances and demographics. He found one town's spending was nearly double that of the other and yet it achieved no better health outcomes and less patient satisfaction with care.⁴ Many health care experts believe these issues result from limited use of low-cost preventive services, lack of primary care coordination and financial incentives that promote volume over value.⁵

The Affordable Care Act addresses these issues through the embedding of three strategies to lead the evolution of the nation's health care system — improving the health of individuals and populations, reducing the per capita cost of health care and improving patient experience of care. Collectively they are called the “Triple Aim,” an approach developed by the Institute for Healthcare Improvement and former administrator for the Centers for Medicare and Medicaid Services, Donald Berwick, MD. Why the Triple Aim? The U.S. health care system is the most expensive in the world, accounting for 17.9 percent of the 2011 gross domestic product with estimates that the percentage will grow to 20 percent by 2020. At the same time, the U.S. has worse health outcomes on many important health measures than other countries spending less.⁶ Simply stated, the U.S. is not receiving enough value for health care dollars spent and there is broad consensus that the current health care system is not sustainable.

An article by Steven Friedrichsen, DDS, begins this issue with a description of how his dental school, Western University in Pomona, Calif.,

implemented curriculum innovations that provide its students a patient-centered, team-based, collaborative experience working with students from other health care disciplines such as medicine, nursing, physical therapy and pharmacy. Much of the experience occurs in community-based environments in partnership with local stakeholders such as First Five. These partnerships also serve to build an interprofessional (IP) infrastructure, increase capacity and allow for the evaluation of different management strategies that support the IP clinical model.

Also in the issue is an article by Harold Slavkin, DDS, and colleagues at the University of Southern California Center for Craniofacial Molecular Biology and Children's Hospital Los Angeles. This article illustrates the benefits of IP clinical care through the historical lens of the first craniofacial team created in 1938 by orthodontist, Herbert Cooper, DDS, DSc, LHD, FACD, to address complexities associated with the treatment of craniofacial birth defects in Lancaster County, Pa. The basic principles of communication, collaboration, cooperation and coordination still apply in the IP team approach today and are necessary to ensure that comprehensive primary care is provided in a culturally appropriate, patient-centered manner sufficient to meet the health care needs of society.

Finally, Paul Glassman, DDS, MA, MBA, describes how the oral health care system has been evolving over the last decade in the face of large-scale changes in the general health care system. He then discusses shifting payment incentives from volume to value. Dr. Glassman concludes by presenting future trends in dental quality measurement, improvement and delivery systems that include an emphasis on IP practice through the integration

of oral health in educational, social service and general health systems.

We thank our authors for generously sharing their knowledge and experience of IPE and a multidisciplinary approach to practice. Our sincere appreciation goes to all of the individuals who participated at the conference as speakers and panel presenters, stimulating rich dialogue and enriching our understanding of the challenges and opportunities on the horizon for dentistry as the health care system evolves. ■

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Panel Proceedings: Conference on Interprofessional Education and Practice

On Feb. 3-4, 2014, the California Dental Association and the American Dental Education Association hosted the Conference on Interprofessional Education and Practice: Creating a Vision for the Dentist of the Future to identify key drivers, examine opportunities and challenges towards greater interprofessional collaboration and practice, and create a vision for the dentist of the future. The following are summaries from the panels.

PANELISTS

Moderator — Michael C. Alfano, DMD, PhD, former dean, New York University (NYU) College of Dentistry and executive vice president, NYU

Richard W. Valachovic, DMD, MPH, president and CEO, American Dental Education Association

Stephen Friedrichsen, DDS, dean, Western University College of Dental Medicine

Judith Haber, PhD, APRN, BC, FAAN, associate dean for Graduate Programs, NYU College of Nursing

Andrew I. Spielman, DMD, MS, PhD, associate dean of Academic Affairs and Research, NYU College of Dentistry

Brian Swann, DDS, MPH, chief of Oral Health, Cambridge Health Alliance, Harvard School of Dental Medicine

Panel One: Transforming Professional Education — Parallel Changes in Medicine and Dentistry

The first session included panelists with a broad mix of experience in various aspects of interprofessional education. The moderator of the panel, Michael Alfano, DMD, PhD, from New York University (NYU), set the stage for a discussion of the challenge at hand by describing the strong negative reaction of some professional organizations to the placement of the NYU College of Nursing within the College of Dentistry 10 years ago. Fortunately, angry threats of boycotts and lawsuits never materialized. Cooler heads prevailed as people realized that each of the educational programs would ensure full compliance with all accreditation standards as the two professions explored ways to reduce educational costs while improving outcomes and enhancing patient care by working together.

Richard Valachovic, DMD, MPH, one of the founders of the Interprofessional Educational Collaborative, provided important perspectives to the panel. He literally was “at the table” as all of the key health professional educational organizations came to recognize the potential high value of better linkages between the respective professions in the interest of better education and improved patient care. He called this movement a “game changer” that would improve the way health professionals are educated and practice in the future. He noted that both market and accreditation forces would foster the inclusion of dentistry into these new models of teaching, learning and practice; and he opined that this would provide an excellent opportunity to expand the reach of the dental profession.

The next two speakers, Andrew

Spielman, DMD, MS, PhD, and Judith Haber, PhD, APRN, BC, FAAN, associate deans respectively at the NYU Colleges of Dentistry and Nursing, presented jointly to describe the past decade of interprofessional education at NYU. Dr. Spielman noted that at the outset of the combination, a study of the overlap of required competencies between dentistry and nursing stood at 38 percent; however, 10 years later, that overlap exceeded 75 percent. This growth was driven partly by an expansion of the dental competencies to include duty, altruism, leadership, interprofessional practice and the like. He also summarized an expansive set of outreach activities both within and outside of the institution. These included multiple research grants, a few dozen publications and the training of scores of professionals from dentistry, medicine, nursing, social work and nutrition across the country.

Dr. Haber expanded this discussion noting that the mutual competencies were achieved using innovative teaching/learning strategies, including collaborative case conferences, primary care clinical rotations for dental students, dental clinic rotations for nurse practitioners, service learning experiences, simulations with standardized patients and the use of virtual case studies. She described a paradigm shift to “put the mouth back in the head” driven in part by transitioning from the traditional head, eyes, ears, neck, throat (HEENT) history and physical exam to the “HEENOT” approach. Finally, she applauded the abundant opportunities for interprofessional research and clinical scholarship that these programs provided. She pointed out that this is a “scalable” interprofessional model by which oral-systemic health can be integrated into the curriculum of other health professions and used to meet interprofessional competencies and accreditation standards.

Joining the panel from a parent institution with one of the strongest commitments to interprofessional health education was Steven Friedrichsen, DDS, dean of the College of Dental Medicine at the Western University of Health Sciences. He stated that WesternU has been successful at wholesale integration of interprofessional education, including the establishment of a culture of interprofessionalism that extends beyond the curriculum. However, he warned that without an endpoint — a successful model or models of interprofessional or collaborative practice — interprofessional education would not reach its full potential to enhance patient care. That said, he underscored that the changes in health care are expanding oral health services beyond both the traditional walls of dental practice and sometimes even beyond traditional dental providers. At the same time, but to a lesser degree, oral health is being viewed as an integral component of overall health.

Dr. Friedrichsen pointed to some prototypical programs that have been successful, including a pilot of dental students collaboratively providing oral health screening, anticipatory guidance and fluoride varnish with graduate nursing and physician assistant students. He also described an innovative program wherein optometry students, using co-location, have added vision screening during waiting times to provide additional efficiency for patient visits. He emphasized that appropriate support and resources must be both available and frequently reviewed, and concluded that, notwithstanding all of the problems associated with startup programs and occasional professional resistance, the opportunities provided by interprofessional education and practice far outweigh the challenges.

Brian Swann, DDS, MPH, of the

Harvard School of Dental Medicine, was the final speaker of the session. He spoke about the concept of the “oral physician,” crediting Don Giddon, DMD, PhD, for his multidecade pursuit of the idea. Specifically, Dr. Swann is working to expand the general practice residency training program such that dentists who graduate from the program are better equipped to provide a more expansive impact on overall health. However, if these oral physicians are to have maximum impact, they need to shed some of the limiting perceptions they share about the practice of dentistry. He used the example of challenging dental residents to be able to ask questions about sexual practices during health histories. He also reported on the high percentage of unreported/undiagnosed facial trauma from abuse as another area where more broadly educated, more confident dentists could have a significant impact on societal health.

A robust discussion period followed the formal presentations of the panelists. The most noteworthy points made during this Q-and-A were that identifying adequate resources to launch interprofessional education programming was critical at the outset. Moreover, it was agreed that the research base on the value of interprofessional education was not yet compelling, and that research on the model must be expanded with rigorous outcome studies as additional concepts are developed.

PANELISTS

Moderator — Linda Niessen, DMD, MPH, MPP, dean, Nova Southeastern College of Dental Medicine

George Isham, MD, MA, chief health officer and plan medical director, Health Partners

Paul Glassman, DDS, MA, MBA, professor of Dental Practice and director of the Pacific Center for Special Care, University of the Pacific, Arthur A. Dugoni School of Dentistry

Panel Two: Quality, Accountability and Cost in the Delivery of Equitable, Effective Care

The second panel served to introduce the audience to the quality improvement movement in medicine, the application of the principles to dentistry and research efforts in this area as they relate to interprofessional education and practice. By way of introduction to the subject, Linda Niessen, DMD, MPH, MPP, described the Triple Aim concept, developed by former Administrator of the Centers for Medicare and Medicaid Services (CMS) Donald Berwick, MD. The three aims are reducing per capita costs of health care, improving quality/patient satisfaction and improving the health of populations. Many health care entities have adopted these as overarching goals for systems improvement.

George Isham, MD, MA, opened the panel with a presentation on the quality movement in medicine and the role the Institute of Medicine of the National Academies (IOM) has played in its advancement. According to a 2013 National Academies' publication, our country spends more per capita and a greater percentage of gross domestic product on health care while experiencing worse health outcomes than any other developed country. Additionally, there is great inconsistency in care quality and fragmentation in how it is delivered, leading to great variability and disparities in health outcomes across the country. The IOM has been leading the nation in calling for solutions to this untenable and unsustainable situation. Two seminal publications have been produced over the years, *To Err Is Human: Building a Safer Health System* in 1999 and *Crossing the Quality Chasm* in 2001, which outline systemic problems in the areas of patient

safety, inefficient use of resources and fragmentation in the delivery of care.

As medical director for Health Partners, a large nonprofit health care delivery and financing organization in Minnesota, Dr. Isham discussed how its health system has implemented quality improvement efforts, which have led to improved health outcomes and lower costs, especially in the prevention and treatment of chronic diseases.

Paul Glassman, DDS, MA, MBA, from the Arthur A. Dugoni School of Dentistry, described why and how the quality movement would have an impact on the financing and delivery of oral health care in this country. Major drivers of change in oral health care include the increasing cost of care, the increasing number of people who cannot or do not take advantage of the current delivery system, unnecessary variability in care and the existence of oral health disparities among segments of the population. Dr. Glassman explained how the oral health care system could be moved from a volume-based to value-based reimbursement strategy by aligning incentives with oral health outcomes, and he outlined steps recommended by the IOM to make the process successful. They include expanded use of data sources such as electronic health records, developing metrics, use of nondental providers to promote oral health in the health home, managing dental disease as a chronic condition and use of telehealth technology in nontraditional settings.

The final panelist, Scott Reeves, PhD, from the University of California, San Francisco, School of Nursing and director of the Center for Innovation in Interprofessional Education, was unable to attend due to illness.

PANELISTS

Moderator — David M. Krol, MD, MPH, FAAP, senior program officer, Robert Wood Johnson Foundation

David Gesko, DDS, dental director, Health Partners Dental Group

Irene Hilton, DDS, MPH, consultant, National Network on Oral Health Access

Tracy Garland, director, National Interprofessional Initiative on Oral Health

Laurie McCauley, DDS, MS, PhD, dean, University of Michigan School of Dentistry

Panel Three: Interprofessional Education — Implications for Delivery System Change

This session was designed to discuss three key areas of interprofessional collaboration: active examples of how medical-dental collaboration is taking place in the field, efforts to increase the oral health knowledge of medical professionals and the science that supports the potential for medical-dental collaboration for improving health. Panel members represented integrated health systems, public health departments, coalitions of professional organizations and academic dentistry. Each panel member contributed his or her knowledge, experience and insights on what has been done, and potentially what could be done in the area of interprofessional collaboration in oral health.

The first set of presentations focused on innovative models of collaborative practice. David Gesko, DDS, from Health Partners in Minnesota described his organization's approach to maintaining the oral health and addressing disease in the populations they serve. Health Partners is a nonprofit, consumer-governed integrated care and financing system that has as part of its array of services 21 dental clinics. Its approach to care is based on the Triple Aim. It pursues the Triple Aim in dental services with care that is based on evidence-based care guidelines, a focus on disease management, disease risk assessment and risk reduction, the preservation of hard and soft tissue, the application of a medical model of care to dentistry and a strong effort to improve the overall cost of care. Dr. Gesko described specific examples of organizational implementation in each of these areas as well as cost savings that have accrued because of those efforts.

Irene Hilton, DDS, MPH, from the National Network on Oral Health Access

then described how community health centers (CHCs) are a logical location to pilot innovation in medical-dental integration and discussed how that should look in CHCs. In those CHCs that were early adopters of medical-dental integration, she described the important role that administrative integration plays in successful overall integration. In such sites, administrative structure and decisions include all disciplines, communication flows well across disciplines and there is mutual respect among those disciplines. She emphasized the importance of clinical infrastructure integration via shared access to patient information across disciplines and referral processes that are easily made and followed up on within and between disciplines. In addition to clinical infrastructure integration, Dr. Hilton discussed clinical practice integration wherein health professionals provide services beyond their traditional silos (e.g., medical staff providing caries risk assessment and fluoride varnish or dental professionals providing HIV testing or smoking cessation). Finally, she described the importance of quality improvement integration that uses measures to monitor and drive change related to level of integration.

The second focus area was on improving the oral competencies of medical providers and was presented by Tracy Garland from the National Interprofessional Initiative on Oral Health (NIIOH). The NIIOH is a consortium of funders and health professionals whose vision is that dental disease can be eradicated by focusing on the oral health education and training systems that support primary care clinicians from disciplines,

including family medicine, pediatrics, nursing, physician assistants, obstetrics/gynecology and internal medicine. It has developed the web-based Smiles for Life educational curriculum that includes modules focused on oral to systemic, child oral health, adult oral health, acute dental problems, pregnant patients, fluoride varnish, the oral exam and geriatric oral health. Ms. Garland also presented the importance of both oral health competencies (health history, oral exam, risk assessment and management plan) and interprofessional competencies (listen actively, understand role and competency of each team member, recognize how skills complement and overlap, address concerns and interprofessional

approach) to meet health needs in order to develop professionals who are ready and willing to address the oral health needs of their patients.

The final panel presentation, by Laurie McCauley, DDS, MS, PhD, dean of the University of Michigan School of Dentistry, focused on science and technology as drivers for integration. Dr. McCauley began her presentation by making clear that there is a lack of evidence, data and proof of the value of interprofessional education. That said, she also pointed out that oral health problems have common risk factors with other diseases and conditions and there may be shared solutions. She reviewed the literature, both positive and negative, on treatment of chronic periodontal disease

and diabetes outcomes and reviewed literature (negative) on the effect treatment of periodontal disease has on pregnancy outcomes. Dr. McCauley also reviewed the literature (slightly positive) on the association of periodontal disease and atherosclerotic cardiovascular disease and reviewed the potential mechanism of this association, though she mentioned that the treatment literature is not adequate to draw conclusions. She did point out that pain management is an excellent opportunity for interprofessional collaboration in education and practice. She concluded by pointing out that in the absence of evidence there is a need for more research in the area of interprofessional collaboration and its effects on health outcomes.

PANELISTS

Moderator – Ronald Inge, DDS, dental director, Washington Dental Service

Paul Manos, DDS, dental director, United Concordia Dental

Fay Donohue, president and CEO, Dentaquest

Allen Finkelstein, DDS, CEO, Bedford HealthCare Solutions

William Ten Pas, DMD, senior vice president, dental services, The ODS Companies

Panel Four: Financing Models That Promote Professional Collaboration to Improve Health Outcomes

Our health care system is currently based on a framework of fee for service and volume of services delivered. The new health and health care system will be based on a framework for outcomes that will drive protocols, quality and reimbursement. The need for health care services will be impacted by many factors: community and environmental features, the biology of disease and individual traits and behaviors. Health care needs will first be assessed at a population level. Systems will be determined by their ability to meet or not meet the needs of the population. Oral health care will be challenged to find its place in these new systems. The success of the systems will be the outcomes experienced at the population level.

For oral health to be integrated into this new system framework, oral health must demonstrate its relevance and value

in four domains: policy, finance, care and community. In discussions on health care policy, oral health must have strong representation to provide justification for inclusion. In the delivery of care, the value of oral health cannot be confined to the mouth but must be integrated into the management of overall health. The value of oral health must have grassroots in the community and that value must go far beyond a smile. An essential thread is the inclusion of oral health in the financial models developed for this new system. A system of financing must be developed to support policy development, delivery of care and community and individual access to the system.

Oregon was one of the first states to embrace the Affordable Care Act. In 2009, the Legislature formed the Oregon Health Authority to consolidate health

policy and oversight for public employees, educators, state hospitals, Medicaid and health analytics. The Oregon Health Authority has no dental representation on its policy board. The Oregon Health Authority created coordinated care organizations (CCO) to address cost and quality in health care. A CCO is a single organization that accepts responsibility for the cost of health care within a global budget. A CCO is a private-sector approach to the health care efficiency and cost reduction, while maintaining standards and safeguards established by the state. These standards are related to the delivery of care, patient management and the quality of care for consumers served by the CCO. Dental contracted organizations (DCOs) were formed to meet the oral health needs. The CCO contracts with and pays the DCO for dental services. Ninety-eight percent of dental patients are covered under managed care plans (capitation). The challenges have been the lack of a common contract with CCOs, the wide range of fees and different reimbursement models from CCOs, lack of technology coordination and a massive increase in administrative burden. A positive result has been the movement of dentistry to formulate and initiate quality measures.

The landscape of dental benefits is changing and as a result, the landscape of dentistry is changing. The list of influential stakeholders is growing. It was once just the dentist, the patient and the dental benefits company. Now it's employers, unions, brokers/consultants, regulators, consumers and a host of other invested parties that influence dental benefits. Dental benefits are not insurance. Dental benefits are a limited defined funding mechanism structure to meet a marketable price point. Benefit design is based on the needs and desires of the purchaser supported

by historical evidence both empirical and scientific. The lack of standards and definition of quality have slowed the development of dental benefit design.

As the dental landscape changes, so does the emphasis on oral health. As dentistry shifts from drilling and filling holes to treating the disease that causes the problem, a new value proposition has emerged — oral health affects overall health. Over the past couple of decades, scientists researching oral disease have demonstrated an association between the health of the mouth and the health of the body. A recent study commissioned by United Concordia and Highmark, conducted by Marjorie Jeffcoat, DMD, demonstrated significant savings on medical cost for several diseases and conditions when patients received periodontal disease intervention and maintenance services. Similar studies have been conducted over the past 10 years with similar results regarding medical cost savings. It would seem logical that such results would give rise to more and better coordination between medical practitioners and dental practitioners. With the emphasis of medical cost reduction in the Affordable Care Act, it would seem logical there would be more dental benefits offering better medical management outcomes. Unfortunately, this transition in coordinated care has been very slow.

One area of health care that is progressing in the coordination of oral health and overall health is primary care. In primary care, the pediatric health home is designed to ensure that all children have access to quality health services that are efficiently delivered, equitably distributed, fairly financed and appropriately utilized by an informed and empowered public. The pediatric health home is a virtual home created by collaboration between health care

providers. Its intent is to provide needed services to the patient whenever the opportunity presents itself. Primary care physicians and pediatricians are being trained to screen children for oral disease during well baby visits. Essential to this training is the establishment of a referral network of dentists who can treat the disease and its consequences when it has progressed beyond the preventive stage. The dental provider also promotes healthy behavior, prevention of disease and facilitates appropriate referrals to both dental and medical specialists. Coordinated care in this manner will result in decreased emergency room and operating room dental utilization resulting in a reduction in the cost of care. The success of the pediatric health home is dependent on an integrated approach for coordinated health care among all health care providers.

Moderator — Dushanka V. Kleinman, DDS, MScD, associate dean of Research, School of Public Health, University of Maryland

Richard W. Valachovic, DMD, MPH, president and CEO, American Dental Education Association

Joel Berg, DDS, MS, dean, University of Washington School of Dentistry

Francisco Ramos-Gomez, DDS, MS, MPH, director for the Pediatric Dentistry Preceptorship Program, University of California, Los Angeles

Harold C. Slavkin, DDS, former dean, Herman Ostrow School of Dentistry of the University of Southern California, and former director of the National Institute of Dental and Craniofacial Research

Arthur A. Dugoni, DDS, MSD, dean emeritus, University of Pacific, Arthur A. Dugoni School of Dentistry

Panel Five: Linking the Trends to Create a Vision for the Dentist of the Future

This session, designed to stimulate “next steps,” had two parts: a set of presentations to stimulate discussion of this vision and a charge to the participants to address key questions to guide “where do we/can we go from here.” These questions included:

- How will dentistry fit into an integrated health care system?
- How will the skill sets of dentists need to change?
- Is it more advantageous for dentists to position themselves as surgical specialists or to expand their roles in the provision of primary care?
- What would be better for the public in terms of patient-centered care and improving health outcomes?

The panel comprised of four internationally renowned leaders who have a wealth of experience in leading initiatives and innovation within dentistry and beyond. Collectively, their experiences bring forth perspectives from leadership positions in federal government, academic institutions, industry and nonprofit organizations. As such, they bring reflections of academicians, researchers, industry leaders, dental school and other health profession school administrators. Another attribute this panel is to be recognized for is their common bond that includes specialization in pediatric dentistry and critical scientific investigations in craniofacial biology. Not surprisingly, these are disciplines and work that mandates interprofessional collaborations. Panel members provided a strong collective response to questions posed for this session.

Richard W. Valachovic, DMD, MPH, provided an overview of the work being done at the national level. He provided the status of the dental professions’

work to address the four competency domains (values and ethics, roles and responsibilities, interprofessional communication and teams and teamwork) that emerged from the Interprofessional Education Collaborative. The growth of new dental schools has been exponential, and currently, the work of all schools reflects a wide range of interprofessional education-related activities from which we can learn. He then challenged the participants to consider three scenarios for the future: a future where there is no change in how the profession practices, a future where interprofessional practice is the norm and a future where dentistry takes an active part in primary care and fully incorporates practices such as blood pressure testing, tobacco cessation, etc. Each scenario will bring a different future.

Joel Berg, DDS, gave a high-level overview of the University of Washington School of Dentistry’s “Dentist of the Future” initiative, an initiative that has just completed its first year. Building on his experience from industry, he described the approach taken to infuse graduating dentists with attributes that would meet the expectations of patients. Using a business model approach, he laid out how they are creating an integrated model of education. This model includes topic-specific “threads” that are interwoven across the curriculum in each year and within courses. The threads include comprehensive diagnosis and treatment planning, ethics and professionalism, cultural awareness and sensitivity, dental practice management, health promotion and disease prevention, dental and maxillofacial surgery, dental and maxillofacial restorative, and human development, growth and function in health and disease. Metrics are

incorporated at each level of analysis and a “dashboard” is created for each student to assess progress and allow for continuous improvement. The data underlying each aspect of this initiative are captured to allow for multilevel assessment in real time. This initiative is aligned with a complementary effort at UW’s medical school and thus allows for cross-fertilization. We have much to learn from this major initiative.

Francisco Ramos-Gomez, DDS, MS, MPH, used the Community Health and Advocacy Training program that he directs to demonstrate the interprofessional education from the perspective of a specialty program. He described the collection of eight modules that provides residents with essential competencies for them to be successful change agents in their communities and practices. These competency areas are not well addressed in dental school, yet are essential if the dental profession is to lead in the broad health movement and work effectively with other health professions, social service directors, community leaders and advocates, legislators, etc. He emphasized the importance of preparing future dentists with the capacity to assess risk at both the population and patient levels, with cultural competency and health literacy skills and the ability to apply and integrate evidence-based findings effectively.

Harold C. Slavkin, DDS, shared two big ideas: lessons from the past that can and will define the future and the impact of genomics on clinical dentistry. He told the story of Herbert K. Cooper, DDS, DSc, LHD, FACD, an orthodontist in Lancaster, Pa., who formed the first interprofessional health care teams to care for patients with cleft lip and/or palate in 1938. Dr. Cooper’s team had the full scope of health, surgical and behavioral disciplines critical to caring for

the patient over his or her early lifetime from infant to young adult. Dr. Cooper’s emphasis was coordination and sequence of care, collaboration and cooperation between team members and proactive communication within the team and between the team, patient and family. Today we have more than 250 such teams in place. Dr. Slavkin’s second idea focused on genomics. He challenged participants with whether dentistry will take an active part or be a bystander (catch the wave or watch from the beach). He presented the volume of emerging technologies that allow for rapid assessment and the opportunities for genetics and genomics to be an integral part of clinical dentistry. This involvement would allow the profession to extend its work, combining our capture of phenotypes with genotypes. He stressed that the call for the profession’s involvement has been strong and is an opportunity now that cannot be missed if we are to provide leadership for craniofacial and oral health. Dr. Slavkin also provided a picture of what an integrated partnership incorporating mental, vision and oral health for all would look like throughout the life span. To allow participants to further consider this future for the dental profession and stimulate further thinking, he provided listings of key papers.

Participants contributed additional insights during the closing discussion. The two dental student participants from NYU’s School of Dentistry challenged participants to have more active communication with students and clearly describe the benefits and the imperative for moving more aggressively into interprofessional education. They also recommended direct involvement of students in the interprofessional education initiatives. In closing, Art Dugoni, DDS, MSD, dean emeritus of the University of Pacific, Arthur A. Dugoni School

of Dentistry, acknowledged that the conference allowed for “excellent and comprehensive detail of the challenges and enhancements of interprofessional education programs with medical and dental colleagues,” and shared his vision for the future practice of dentists trained in an interprofessional education model. He spoke of the “oral physician of the future as a ‘conductor’ (‘maestro’) of oral health prevention and care.” He stated that this oral physician will be “highly educated in the biological, genetic, engineering and behavioral sciences, and in delegation and team management. Within an integrated health care delivery system, this oral physician would work in ‘concert’ (group practice setting) with a team of formally educated allied health professionals with special individualized skills who carry out the various preventive, cosmetic, restorative procedures. This would free oral physicians for individual growth, initiative, innovation and intellectual stimulation to serve and lead their communities in oral health programs and initiatives.” ■



Innovations in Interprofessional Education: Building Collaborative Practice Skills

Steven Friedrichsen, DDS; Timothy S. Martinez, DMD; Josih Hostetler, BA, MSW; and Julie M.W. Tang, DMD, MPH

ABSTRACT The Institute of Medicine advocates redesigning the health care system through interprofessional education (IPE) and collaborative practice. These strategies are game changers. Western University embraces this paradigm shift with an IPE curriculum for all students in 13 health care disciplines. Further, the College of Dental Medicine's innovations in community-based dental education and local programs such as the Children's Dental Care Project are preparing students as future interdisciplinary teams to improve patient care.

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Conflict of Interest
Disclosure: None reported.

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Conflict of Interest
Disclosure: None reported.

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Conflict of Interest
Disclosure: None reported.

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Dentistry and oral health care are being pulled in multiple directions by a variety of influences.¹⁻⁷ While definitive outcomes from these influences are still elusive, it is evident that interprofessional education (IPE), interprofessional collaborative practice (IPCP) and team-based care will become integral components of future health care practice, including dentistry. This paper provides a brief background on the value and necessity of IPE and IPCP, describes the IPE Initiative at Western University of Health Sciences (referred to in this article as WesternU and the university; see **TABLE 1**), illustrates innovations at the WesternU College of Dental Medicine (CDM) that contribute to integrating IPE/IPCP, and reports initial program findings. IPE and IPCP are still early initiatives at the

university, but they have quickly become part of the institution's culture and have developed into a collective strength.

Interprofessional Education and Interprofessional Collaborative Practice

Richard Valachovic, DMD, MPH, president and CEO of the American Dental Education Association (ADEA) identifies IPE and IPCP as game changers that will transform the way that health professionals are educated and health care is delivered, moving health care from a silo-based to a team-based approach.⁸ The transition is already under way. Changes are "not just minor revisions of the rules" but "represent a systemic change in the culture of health professions' education and practice."⁸ IPE and IPCP will help move the health care system from fragmentation to a position of strength.⁹

TABLE 1

Acronym Definitions

ADEA	American Dental Education Association
ATOSCE	Ambulatory Team Observed Structured Clinical Evaluation
CBDE	Community Based Dental Education
CDCP	First 5 Los Angeles Children's Dental Care Project
CDM	WesternU College of Dental Medicine
CMS	Centers for Medicare and Medicaid
CODA	Commission on Dental Accreditation
FQHCs	Federally Qualified Health Centers
IHI	Institute for Healthcare Improvement
IPE	interprofessional education
IPEC	Interprofessional Education Collaborative
IPCP	interprofessional collaborative practice
LA	First 5 Los Angeles
SBHCs	school-based health centers
WesternU, the university	Western University of Health Sciences
WHO	World Health Organization
WIC	Women's, Infants and Children

It is widely acknowledged that a redesign of the health care system is needed to improve the health of populations, promote quality and satisfaction with patient care, and reduce the per capita cost of health care. This is the Triple Aim developed by the Institute for Healthcare Improvement (IHI) to optimize health system performance, and it has been adopted by the Centers for Medicare and Medicaid (CMS).¹⁰ To build a valuable IPE program, the training will ultimately need to produce a new health care workforce able to achieve the Triple Aim.

Well-documented trends point to the necessity of IPE and IPCP in dentistry and oral health care. One of these is the

expansion of oral health care delivery beyond the walls of the traditional dental practice and beyond established dental providers. This is observed in the delivery of safety-net oral health services, shifting to a growing number of Federally Qualified Health Centers (FQHCs), school-based health centers (SBHCs) and nondental providers.

In the 1960s, only eight health centers existed in the U.S. By 2011, 1,128 FQHCs and FQHC look-alikes provided care to 20 million Americans at more than 8,000 delivery sites. FQHC dental visits tripled in a decade to 9.2 million in 2011.¹¹ SBHCs also continue to grow. A 2010-2011 census reported 1,930 centers in 46 states, the District of Columbia and three territories; 340 new centers have been established since 2007-2008.¹² In more than a third (39 percent) of SBHCs, a dentist or dental hygienist provided dental examinations. Also, in an emerging role for SBHC primary care providers, well over 80 percent provided oral health guidance/referral and risk assessment. In 2013, Medicaid reimbursed nondental providers (physicians, physician assistants and/or nurses) for caries prevention services in 44 states.¹³

A second trend is the growing recognition outside of dentistry that oral health is an integral component of overall health. For example, health insurers funded the United Concordia Oral Health Study and the United Healthcare Medical Dental Integration Study to evaluate the importance of oral health and its connection to overall health.^{14,15} The studies examined medical and dental claims of plan members who have chronic medical conditions (such as diabetes and heart disease) as well as periodontal disease. Findings showed that total medical costs were considerably lower for individuals with chronic

conditions who received periodontal treatment or cleanings, even with the additional costs of dental treatments.

Another example is the American Academy of Pediatrics advocating the importance of partnerships between pediatric medical and dental homes and guiding pediatricians to incorporate oral health assessments and education into their well-child examinations.¹⁶ Further support for this trend is seen in the renewed interest in integrated health services,¹⁷⁻¹⁹ leading to exploration of dentistry's role within primary care.²⁰ Dentists assuming a more active role in the provision of primary care services for the patients they treat is increasingly valid.

The trends of oral health care expansion and the increasing value of oral health to overall health form a compelling case for including IPE in dental education. The growing recognition of the value of team-based collaborative care means that IPCP will play an increasingly important role in the education and training of dentists as well.

The IPE Initiative at WesternU

The World Health Organization (WHO) defines IPE as "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes." IPCP is "when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers/givers and communities to deliver the highest quality of care across settings."⁹ IPCP allows health workers to engage any individual whose skills can help achieve local health goals to strengthen health systems and improve health outcomes.⁹

The senior leadership of the university embraced the paradigm shift in training the future health workforce

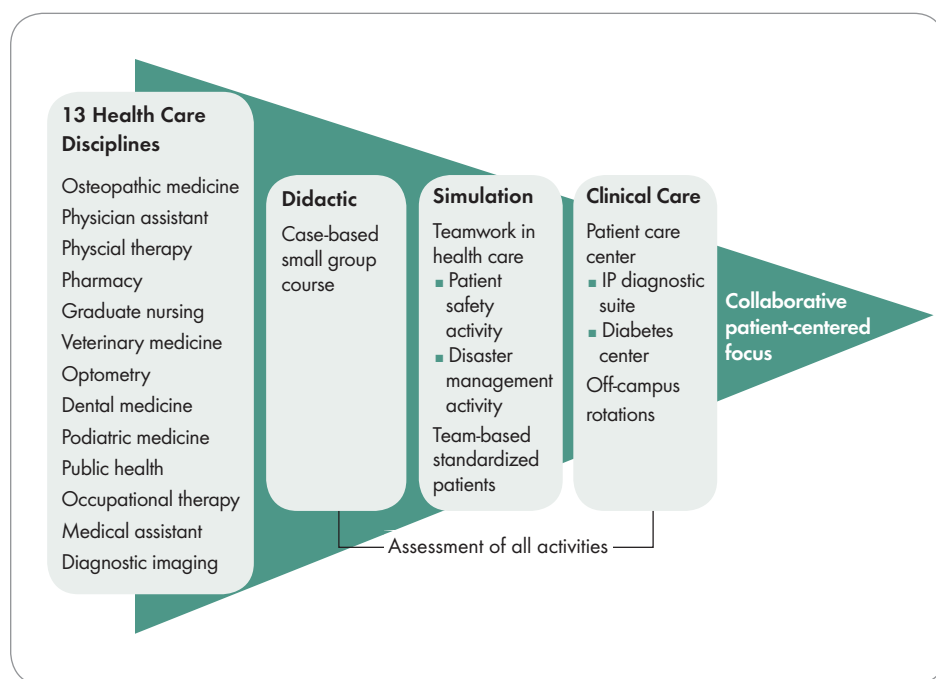


FIGURE 1. Western University of Health Sciences interprofessional education (IPE) model.

Commission on Dental Accreditation (CODA) Standards for dental education programs²³ and is guided by the IPCP core competencies recommended by the Interprofessional Education Collaborative (IPEC).²⁴ IPEC was formed in 2009 by six national education associations of health profession schools representing dentistry, osteopathic medicine, nursing, pharmacy and public health.²⁵

The WesternU IPE Model

The university's IPE Model²¹ is shown in **FIGURE 1**. Health profession students in all disciplines (including dental medicine, osteopathic medicine, graduate nursing, physical therapy, pharmacy, etc.) at the university's Pomona campus are involved in the IPE program. Students in four additional disciplines (public health, occupational therapy assistant, medical assistant and diagnostic imaging) at Oregon State University and Linn Benton Community College also participate through their partnership with WesternU's Lebanon campus. At the university, IPE is an endeavor that includes all health science programs, both campuses and multiple institutions. One WesternU doctor of physical therapy student said, "Working together on cases enabled me to begin networking with future professionals from many different health professions. It gave me a stronger knowledge base from which to build professional relationships and ask educated questions of other health professionals."

The university's IPE curriculum²¹ is designed to progressively advance knowledge and skills through didactic instruction, simulation and clinical care. The IPE experience has been planned and offered in three phases:

- IPE Phase I (first year) includes problem-based learning in small groups. Each dental student joins a team of nine students

and transforming the health care system through its early commitment to an IPE initiative. The mission statement of the initiative is to produce "humanistic health care professionals who provide and promote collaborative patient-centered care and coordinated health care management."²¹ In 2007, the university began planning at the first IPE committee meeting, which engaged more than 80 faculty, staff and administrators. In fall 2009, the university rolled out the first phase of a campuswide IPE curriculum for all health sciences colleges at the Pomona, Calif., and Lebanon, Ore., campuses.

For CDM, the IPE initiative has always been a part of the professional education of dental students, starting with the enrollment of the first predoctoral class in 2009. IPE weaves interdisciplinary group learning, standardized patient simulation and IPCP clinical experiences into the dental program. In addition, the CDM is using its community-based dental education environment to develop IPCP models, evaluate practice management strategies and build IP infrastructure with regional and local partners through

programs such as the First 5 Los Angeles Children's Dental Care Project (CDCP). These collaborative practice models allow dental students to apply IPE concepts and principles in their community experiences.

Global Learning Objectives for IPE

At the university, the global learning objectives for IPE aim for students to function in an interprofessional team, carry the knowledge, skill and values of the program into their future practices and provide patient care as part of a collaborative team with a focus on improving patient outcomes. An interprofessional (or interdisciplinary) team will have members from different health professions who have specialized knowledge, skills and abilities.²² Team members establish a common goal, synthesize their observations and profession-specific expertise, and collaborate and communicate as a team. Joint decision making is valued and each team member is empowered to assume leadership on patient care issues appropriate to his or her expertise.

IPE is required under the current

from other professional programs with a faculty facilitator.

- IPE Phase II (second year) offers each dental student the opportunity to work with students across all disciplines through online teamwork, followed by an in-person capstone event where student teams reflect, focus and apply IPE concepts and clinical expertise.
- IPE Phase III (third and fourth years) focuses on the Ambulatory Team Observed Structured Clinical Evaluation (ATOSCE), a training and evaluation tool for improving awareness and skills related to interprofessional collaboration, teamwork, communication, patient safety and psychosocial issues.²⁶ Phase III also builds collaborative practice activities into direct patient care.

Transition From IPE to Interprofessional Collaborative Practice

Training in Phases II and III focuses on applying IPE knowledge and skills to prepare students for interprofessional collaborative practice (IPCP). Students have opportunities, although still limited, to participate in IPCP at the WesternU Patient Care Center²⁷ located on the Pomona campus. Students also gain IPCP experiences through off-campus rotations coordinated by their health science programs. Productive and valued IPCP experiences have been created for students at the university's CDM through its community-based dental education (CBDE) program by connecting with other health science programs to provide interdisciplinary team-based care.

CBDE

CDM has developed CBDE as an integral component of the predoctoral dental program. Dental students' primary clinical experience in IPCP is provided

through CBDE as they learn collaborative approaches to patient care in a variety of settings. Such experiences allow students to learn about multiple patient-centered care practices and provide oral health care beyond traditional dental school clinics. CBDE prepares a future workforce to engage with communities, provide team-based care and improve access to care.

Traditionally, CBDE rotations in dental schools occur during the fourth year, when students are immersed in a community setting for a period of four to six weeks or longer. Our CDM

Students are trained to provide outreach, triage and patient care to at-risk populations as part of collaborative integrated services.

model is designed to involve students throughout their dental school experience. Students begin service learning in their first year and enter the CBDE in their second year. They first build confidence through patient interactions with at-risk populations for prevention and education. They start by working with infants and their mothers or caregivers onsite at Women's, Infants and Children (WIC) centers. As the students advance into their third and fourth years, their CBDE expands into FQHCs, SBHCs and other local programs. With CBDE training in diverse settings, students work with many at-risk patients (pregnant mothers, infants/toddlers/children from low-income families, developmentally disabled individuals and senior adults residing in long-term care facilities).

As students advance through clinical training during their second through fourth years on campus, they also advance in delivering more comprehensive patient care in CBDE settings.

WesternU's paradigm shift in CBDE is accomplished with an integrated curriculum that ties together basic science, preclinical and clinical dentistry to prepare dental students for community service. Course topics and clinical training are sequenced and timed appropriately to prepare the students to first deliver early prevention of dental caries and oral health education services. Later, students provide more advanced clinical care in community practices. During these formative training years, students interact with medical professionals, social agency workers and caregivers in team-based patient care to develop skill sets for IPCP. Students are trained to provide outreach, triage and patient care to at-risk populations as part of collaborative integrated services.

The development of collaborative care can be thought of as a continuum — starting with co-location of services, progressing to coordination of care among disparate providers and, finally, collaborative team-based patient-centered care. Our CDM's CBDE environment provides opportunities to involve dental students by incrementally building toward collaborative team-based patient care.

Many CBDE sites offer co-location of services and have at least some elements of coordination of care. They are logical venues for involving dentistry and oral health care in IPCP. In addition, CBDE sites are often interested in developing, piloting and evaluating collaborative practice models. Recently, major strides to achieve this goal have been made through the funding of the First 5 Los Angeles Children's Dental Care Project (CDCP) at the university.

First 5 Los Angeles CDCP at WesternU

First 5 Los Angeles (LA) is a unique child advocacy organization created by California voters to invest tobacco tax revenue in health, safety and early education programs. First 5 LA CDCP is an initiative with the goal to provide dental care and develop linkages to a dental home for more than 95,000 children up to 5 years of age in L.A. County. In July 2012, the First 5 LA Commission approved funding for a five-year period to reach this goal with strategic partners: WesternU, University of California, Los Angeles and University of Southern California, the three dental schools in L.A. County.²⁸

CDCP at the university will work in the Eastern L.A. County area to provide dental care and establish dental homes for children by age 1. Our model for CDCP will link SBHCs to create dental homes within the El Monte City and Pomona Unified School Districts. Comprehensive oral health centers are established at selected SBHCs on school sites.

The WesternU CDCP model is patient centered and community based. The model is also in line with the Institute of Medicine's call to ensure that students and professionals develop and maintain proficiency in five core areas to work effectively in a multidisciplinary environment: delivering patient-centered care, working as part of interdisciplinary teams, practicing evidence-based medicine, focusing on quality improvement and using information technology.²²

CDCP at the university began operations in 2013. Early setup activities included expanding program capacity through community partnerships, building new dental homes (community clinics), establishing a system for care coordination, training dental

and nondental providers, developing program sustainability and using emerging technology to increase access and improve patient care. The CDM faculty and dental students provided clinical services in the past year that included oral health education for children and parents or caregivers, enrollment of children into dental homes, patient assessments (oral screening, dental examination and caries risk assessment), preventive care and dental restorative care.

Also essential to the CDCP operation of the Oral Health Centers located

CDCP applies state-of-the-art technology for cross-integration between medical and dental services to improve access and patient care.

in the schools is the involvement of school nurses and district health staff who screen and schedule patients. Unique to the WesternU model is the ability of school nurses and health staff to schedule patients directly into an Oral Health Center for their first visits, using an electronic scheduling system. This capacity and linkage are vitally important should a child need urgent dental care. Similarly, if the dental team at an Oral Health Center determines the need for a medical referral, they can directly make an appointment for the child. CDCP applies state-of-the-art technology for cross-integration between medical and dental services to improve access and patient care.

Building a collaborative practice within SBHCs and integrating oral

health services have opened opportunities for CDCP at the university to develop interdisciplinary team activities. These include:

- Faculty and students at the university's College of Optometry are conducting comprehensive eye examinations for dental patients in waiting areas of the Oral Health Centers. They also schedule children and families for care in their school-based optometry centers. CDCP at the university will continue to expand this type of linkage with other health disciplines, as part of a collaborative approach to patient care and integrated health services, to meet overall health needs of children and families served at school sites.
- A pilot study engaged the university's College of Allied Health Professions and College of Graduate Nursing. Students working in interdisciplinary teams delivered oral health care using an evidence-based clinical protocol for disease management and prevention of dental caries.²⁹ Physician assistant and graduate nursing students were paired with dental students, and these teams used the Caries Management by Risk Assessment (CAMBRA) approach to determine care for high-, moderate- and low-risk patients. Teams provided oral health screenings and fluoride varnish applications to children and anticipatory guidance to parents and caregivers. A total of 98 physician assistant students and 19 graduate nursing students participated in the pilot and reported that they found the experience beneficial and relevant for their careers.
- CDCP at the university has a strategy for community outreach

and delivers oral health assessments and appropriate triage in dental homes for a large number of infants and children. WIC, early Head Start, Head Start, Los Angeles County Office of Education, and Regional Centers serving individuals with developmental disabilities have entered into an agreement with the university to allow oral health assessments and prevention services at their sites. The CDM has enlisted health professionals as interdisciplinary teams to collaboratively identify children with urgent and other treatment needs and refer them to an Oral Health Center if the child does not have a documented dental home. WesternU's physician assistant and graduate nursing students have also joined outreach efforts to schedule new patients into the dental homes after reviewing pertinent findings with dental students.

The CDCP at the university will continue to coordinate with community health providers, other health science colleges and state and local partners to develop collaborative practices and interdisciplinary teams. Graduates will be able to draw on interdisciplinary experiences and apply this training to their future practices to improve the health of children, families and communities.

Program Outcomes

Early outcomes have shown promising results from the IPE initiative. However, it is still a young program and rapid-cycle changes to refine the curriculum have complicated the collection of comparable longitudinal data. The comprehensive IPE Assessment Plan (TABLE 2) and evaluation processes have led to planning additional curriculum improvements that include:

TABLE 2

Western University of Health Sciences Interprofessional Education (IPE) Assessment Plan

IPE curriculum	Orientation	Case-based learning	Team simulations	Patient care
Attitudinal measures	Beliefs and collaboration	Respect for collaboration and other professions	Collaborative orientation, interpersonal styles	Collaborative orientation, transfer barriers
Knowledge and skill measures	Understanding of IPE	Understanding of IPE collaboration skills	Behavioral checklists and rubrics	Team and individual performance ratings
Patient outcomes measures			Simulated patient outcomes	Patient outcomes in partner clinics

TABLE 3

Familiarity With Concept of IPE at Orientation

	2010 Entering Class		2011 Entering Class	
	Dental students	All other students	Dental students	All other students
Not at all	3%	5%	10%	9%
Slightly	52%	37%	39%	36%
Somewhat familiar	39%	50%	43%	46%
Very familiar	6%	7%	8%	9%

TABLE 4

Decision to Attend WesternU

	2010 Entering Class		2011 Entering Class	
	Dental students	All other students	Dental students	All other students
No influence	20%	25%	20%	22%
Slight influence	36%	27%	24%	29%
Some influence	39%	31%	47%	34%
Strong influence	4%	16%	10%	15%

TABLE 5

How Effective Was this Course at Helping You Gain Perspective About Why an Interprofessional Approach to Patient Care Was Important?

	2010–2011 Outcomes		2011–2012 Outcomes	
	Dental students	All other students	Dental students	All other students
Not at all	5%	12%	9%	10%
A little	27%	19%	21%	20%
Somewhat	49%	41%	29%	44%
A lot	19%	28%	41%	26%

TABLE 6

Skills Enhanced by the Course

This course has...	Agree	Disagree
Enhanced my asynchronous communication skills	71.7%	28.2%
Enhanced my understanding of why collaborative care is important	78.7%	21.3%
Made me better appreciate the importance of leadership in health care teams	78.2%	21.7%
Expanded my knowledge of other professions' scope of practice	78.7%	21.3%
Helped me to expand my understanding of who is on the health care team	78.7%	21.3%

TABLE 7

Effectiveness of Learning Groups

Statement	Agree	Disagree
I felt that I was able to contribute effectively to the group discussions	78.8%	21.2%
My student groups worked well together	92.5%	7.5%
Having students from other programs in the group deepened my understanding of the course material	81.8%	18.1%
The members of my small groups treated other individuals and professions with respect	93.9%	6.0%

- Updating IPE training modules and materials to improve student skills and performance.
- Producing teaching toolkits for faculty.
- Examining variance in student competencies across programs.
- Developing pilot studies to test and improve IPCP.

The following are initial findings from university research efforts on IPE courses and experiences and from CDCP observations. These findings illustrate the progress made to date:

Familiarity and influences of IPE at orientation. With each incoming dental class, students were asked at orientation if they were familiar with the concept of IPE and if IPE influenced their decision to attend the university. In recent years, more dental students reported being “somewhat familiar” or “very familiar” with the concept of IPE. More students also reported that IPE asserted “some influences” or “strong influences” on their decision to attend the university. A comparison showed that 51 percent of dental students reported being “somewhat familiar” or “very familiar”

in 2011 compared to 45 percent in 2010 (TABLE 3).³⁰ Also, 51 percent of dental students reported “some influences” or “strong influences” in 2011 compared to 43 percent in 2010 (TABLE 4).³⁰

Perceived effectiveness of courses in IPE Phase II. Dental students were asked, “How effective was this course at helping you gain perspective about why an interprofessional approach to patient care is important?” In the 2010 fall semester, 49 percent of the students reported their IPE course was “somewhat” effective and 19 percent reported “a lot” effective. By the 2011 fall semester, more students perceived higher value in their IPE course — 29 percent reported “somewhat” effective and 41 percent reported “a lot” effective (TABLE 5).³⁰ A large majority of students reported in the spring 2013 course completion data that their IPE skills were enhanced and their knowledge was expanded by their Phase II courses (TABLE 6).³¹ Students also reported effective learning with their interdisciplinary student groups in the most recent (2013) Phase I course completion outcomes data (TABLE 7).³¹

Progress and performance outcomes in IPE Phase III. The Ambulatory Team Observed Structured Clinical Evaluation (ATOSCE) was developed to measure collaboration/teamwork behaviors and skills in a realistic simulation for graduate students in the health care professions. The ATOSCE evaluated students’ progress and performance outcomes for WesternU’s IPE curriculum. A pilot of 42 dental and other health professions students rated the ATOSCE learning experience. All participating students found the ATOSCE a valuable experience that provided an opportunity to use their collaboration skills and demonstrate clinical competencies. Three-fourths of the students (72 percent) said they used information from their IPE coursework and 93 percent indicated they were able to advocate for the patient’s needs during the simulation. Most students (88 percent) reported that they would like to participate in similar experiences in the future.²⁶

Development and evaluation of IPCP models. CDCP at the university is developing promising IPCP models. One such model incorporates essential components for success. It consists of a comprehensive Oral Health Center strategically placed adjacent to WesternU’s CDCP administrative offices. The center is located in a large mall owned by the Pomona Unified School District that has been refitted for administrative offices and service centers. Additional family-centered agencies and programs housed in this mall include WIC, Free/Reduced Lunch Program, Child Development, Foster Care, YMCA, etc. The advantages of this model include IPE/ IPCP training that can be efficiently supervised by CDCP faculty, easy access to a large number of parents

and their children with events such as open enrollment, a convenient environment to build interdisciplinary teams and integrated health services and a culture of collaborative support among children and family-centered agencies and programs under one roof.

Infrastructure for IPCP. The university's CBDE environment is being used as a platform to build infrastructure (people, systems and resources) for IPCP development. WesternU CDM has proactively designed CDCP to create collective impact, which results when a group of stakeholders from different sectors commit to a common agenda for solving a specific social problem and using a structured form of collaboration.³² The CDM will be able to integrate IPCP into collective impact efforts by building CBDE partnerships, embedding IPCP into a common agenda and sharing a goal to improve the oral health care of young children through collaborative team-based health care.

Discussion

The changing landscape of dentistry and oral health care demands significant changes in the way health care providers are educated and trained to prepare a workforce for the transition. Existing oral health care trends and forces support IPE in dental education. Dental students and practicing professionals need to understand how interprofessional collaboration applies to health care, how interdisciplinary teams work and how IPCP delivers team-based care.

As one of the early adopters, the university has implemented a university-wide IPE initiative with a new curriculum. WesternU CDM has integrated IPE and IPCP experiences into its community-based dental education program, creating opportunities to understand how IPE and IPCP work in local context. The

CDM aims to develop, evaluate and identify IPCP models that are able to achieve the Triple Aim, a return on investment and sustainability.

While a ready health workforce is essential to effective collaborative practices, by itself it will not guarantee delivery of optimal health services. Building institutional support is important, which includes testing models for governance (roles/decision-making), developing shared operating resources, establishing personnel policies and implementing management practices. Other needs include promoting a working culture (communications/conflict resolution policies) as well as developing physical settings (facilities/space design).

The next steps for the university include further planning, refining the IPE curriculum, building infrastructure and developing best practices. Investments are needed to provide appropriate support and resources in developing IPE and IPCP, to develop opportunities for research and evaluation of IPE/ IPCP outcomes and to establish more broad-based pilots for IPCP. WesternU will continue its commitment to advance IPE and IPCP. ■

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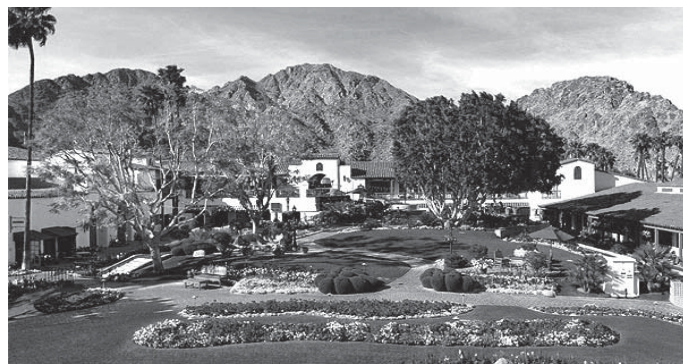
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A Model for Interprofessional Health Care: Lessons Learned From Craniofacial Teams

Harold C. Slavkin, DDS; Pedro A. Sanchez-Lara, MD, MSCE; Yang Chai, DDS, PhD; and Mark Urata, MD, DDS

ABSTRACT Seventy-six years ago, Herbert K. Cooper, DDS, DSc, LHD, FACD, created the first interprofessional health care team in response to the frequency of craniofacial anomalies and related speech and hearing deficits in Lancaster, Pa. His experiences and those from subsequent “medical-dental-nursing-pharmacy allied health professions” craniofacial teams inform and provide “best practices” for the future of interprofessional education. This paper revisits the genesis of craniofacial teams and highlights successes, challenges and cost benefits applicable today.

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Conflict of Interest
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Conflict of Interest Disclosure: None reported.

The history of craniofacial team health care dates back to a visionary dentist in Lancaster County, Pa., who recognized the difficulties inherent in the diagnosis and treatment of patients with craniofacial anomalies and the need to integrate health and social services of many specialists into a patient-centered team approach. This first craniofacial team, the Lancaster Cleft Palate Clinic, was founded in 1938 by Herbert K. Cooper, DDS, DSc, LHD, FACD, an orthodontist trained at the University of Pennsylvania.¹⁻⁵ Shortly after his dental school graduation, he studied orthodontics as an apprentice with Martin Dewey, DDS, MD, and in 1924 began the only orthodontic practice between Philadelphia and Pittsburgh.

Beyond “crooked teeth,” Dr. Cooper realized the complexity of providing

comprehensive treatment to children who had craniofacial birth defects. He wanted to recruit a team of diverse experts who together could provide a scientific and developmentally appropriate sequence of clinical services to those with cleft lip and/or cleft palate and associated craniofacial anomalies.^{2,3} He realized that a team could address the symmetry of the craniofacial-oral-dental configuration, esthetic appearance, oral-pharyngeal functioning in speech and psychosocial adjustment with peers and within family and community. He understood that one health professional could not tackle such a multifaceted set of problems and advocated for clinical outcomes that achieved adequate physical, emotional, social, educational and vocational adjustment.¹⁻⁵ Dr. Cooper's ideas and practices presaged a revolution in interprofessional team health care.

Science Is the Fuel

As science has provided the fuel for technology and advances in all areas of health care — medicine, dentistry, pharmacy, nursing and the array of allied health professions (e.g., speech therapy, audiology, physical therapy, occupational therapy, dental hygiene, child life specialists, nutritionists) — diagnosis, treatment and outcomes for children with cleft lip/palate have shown enormous progress.⁶⁻¹⁴ Dr. Cooper's call for communication, collaboration, cooperation and coordination of effort applies in the present time even more than it did in 1938 when he first articulated and acted upon these ideas.⁴

Importance of the Interprofessional Team Approach

Congenital craniofacial malformations occur with relatively high frequency around the world. In the U.S., an infant is born every hour with an isolated or syndromic form of craniofacial

malformation (globally, the rate of orofacial clefting is one every 2.5 minutes).⁶⁻⁸ Normal speech, hearing, vision, facial appearance, cognitive functions and dental occlusion are routine goals that are expected and generally achievable in many cases.⁷ The challenge remains to diagnose accurately and to gain team member agreement regarding treatment planning and clinical efficacy. With respect to these challenges, it is important to understand the difference between *multidisciplinary* teams and *interdisciplinary* teams. According to Day, "A multidisciplinary

Dr. Cooper's call for communication, collaboration, cooperation and coordination of effort applies in the present time even more than it did in 1938.

approach can occur as a series of isolated evaluations by several disciplines and does not imply the merger of evaluative insights of the shared development of a treatment plan which are the hallmarks of a functional interdisciplinary team."¹⁵

Because the affected individual presents diverse needs, cleft lip/palate and related craniofacial malformations and syndromes have helped to define the frontier of cross-disciplinary and interprofessional collaboration in the creation of craniofacial teams and have provided a highly adaptable model for other fields of health care (e.g., cardiovascular, neoplastic, pulmonary and orthopedic diseases and disorders).^{7,8} Great strides have been made in diminishing "silos," the discipline-based barriers that have historically separated the disparate cultures and activities that influence



FIGURE 1. Dr. Cooper in the Lancaster Clinic with a few team members (1938-1939). (Image courtesy of the Lancaster Cleft Palate Clinic.)

craniofacial patients' care and treatment.⁷ In addition, efforts have progressed toward the creation of porosities in the walls of the barricade, through multidisciplinary training programs, funding opportunities, interdisciplinary research activities and clinical and community care. The result of this progress is health care that profoundly improves outcomes for patients and their families.⁶⁻¹⁴

In this paper, we have adopted Dr. Cooper's matrix to illustrate the essentials from "best practices" as well as ways of thinking about transformational leadership and the critical skills that enable comprehensive quality results.¹⁶⁻¹⁸ Communication is the sharing and exchange of ideas and information, while cooperation describes the activity that joins two or more people or entities, and coordination of effort is bringing together the work of these people or entities. In this era of limitless possibility, however harnessed by scarcity of resources, we need to further actualize Dr. Cooper's message through overt, direct action that fosters even greater teamwork, partnerships, group efforts and other alliances. Toward this end, we have taken the liberty of adding "collaboration" to our discussion, and we believe Dr. Cooper would approve.

A dominant and sustained force propelled the discipline of craniofacial biology and activated transformational leadership within the field, resulting in a fruitful combination of four elements: communication, cooperation, collaboration and coordination.⁸

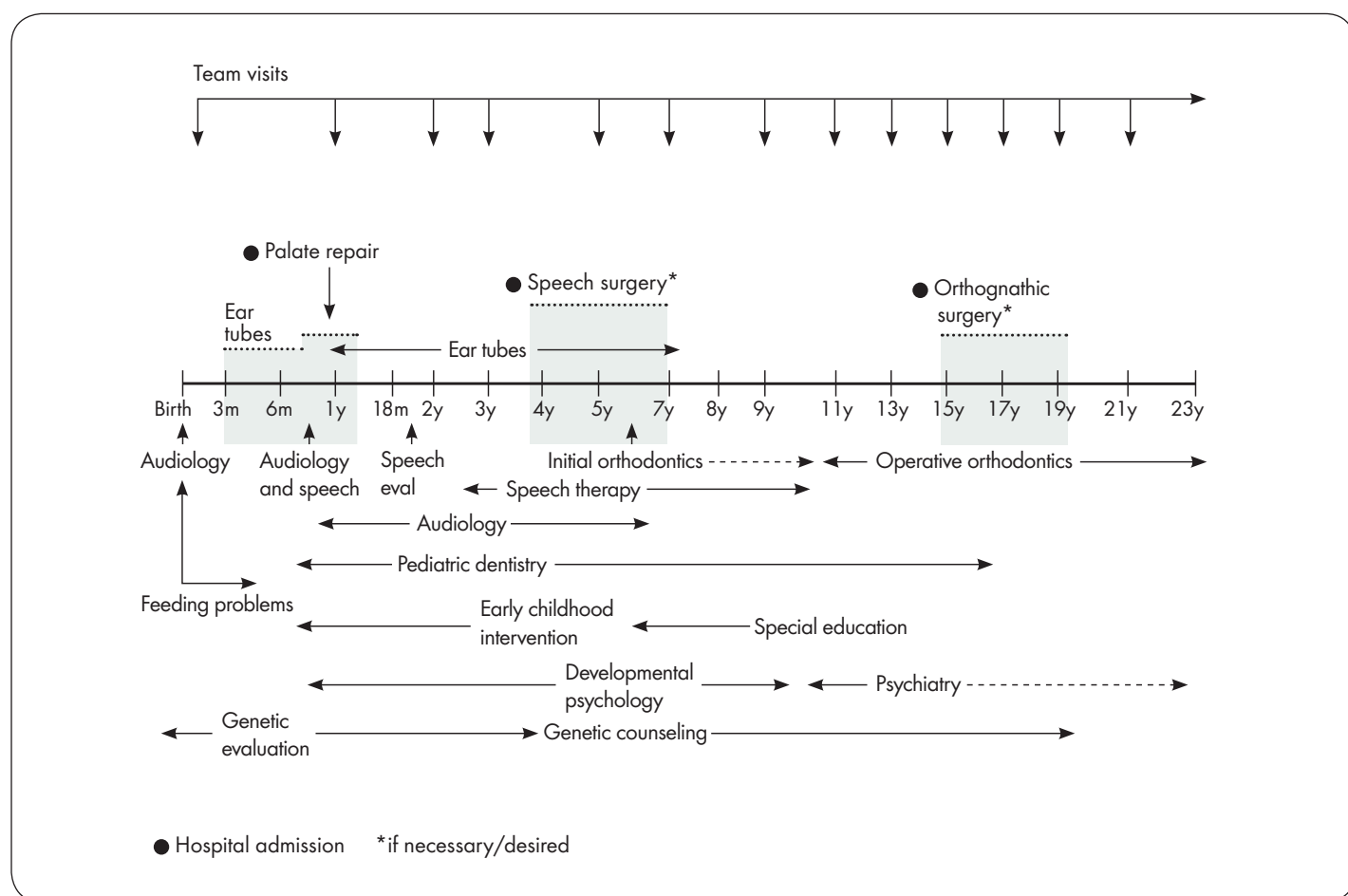


FIGURE 2. Current Children's Hospital Los Angeles craniofacial team's timeline for sequence of treatment for cleft lip and palate.

Successful communication among the biomedical sciences, as well as among clinicians, patients and families, foundations, pharmaceutical and medical device companies and science-directed federal funding agencies, signifies shared goals, a common language and participatory approaches. Newsletters, one-on-one discussions, workshops bringing together scientists with patients and their families, scientific conferences and symposia, the Internet and web-based social networks all facilitate this communication. These processes can readily apply to the creation of additional interprofessional teams that address oral health care for special needs patients, medically compromised elderly and community-based "health

or wellness homes." The reader is encouraged to assess the critical analysis of the craniofacial team, establishment of teams, team process and assessment and improvement of the team process as presented by Fox and Stone.^{7, 18-19}

The impetus toward cooperation is driven by enlightened self-interest, interdependency between various scientific and clinical disciplines, and broadly shared acknowledgement for participation. Collaboration results from genuine excitement about solving complex problems related to congenital and acquired craniofacial anomalies. Coordination is achieved through charismatic, often transformational leadership, a community awareness shared by each participant as to what

the goals are and who will do what, when, where and how, along with sustained involvement and funding.

While attending a conference at New York University, one of the authors, Dr. Slavkin, was introduced to Dr. Cooper and learned first-hand about his ideas.⁴ Dr. Cooper explained that in the 1930s, when he was the only dental specialist between Philadelphia and Pittsburgh, he realized that patients could not be treated by only one health professional. Rather, craniofacial patients required a sequence of complex and developmentally appropriate treatments from a multidisciplinary team of physicians, dentists, therapists, basic scientists (genetics, embryology, developmental biology, anatomy, pharmacology) and

social and psychological caregivers.² He advanced a mission statement in the late 1930s describing his pioneering Pennsylvania Clinic, to provide “totally coordinated treatment for infants, children and adults with oral-facial handicaps and to enhance the quality of care through research, publication and education.”¹¹⁻⁵

Today, more than 76 years later, through numerous partnerships and collaborations designed to leverage finite human and expendable resources (e.g., federal and state grants, United Way and Volunteer Centers, the Lancaster Rotary Club, the Lancaster County Dental Directory, parent support groups and an endowment fund), the Lancaster Cleft Palate Clinic continues to provide medical, surgical, dental, prosthodontic, orthodontic, speech and hearing interprofessional team health care services to thousands of people.^{20,21} For decades, Dr. Cooper provided the leadership and vision for a practical model of craniofacial team building, clinical and translational research that extends from causation to treatment outcomes, and the infrastructure for a sustainable strategy to address the special needs of patients with congenital craniofacial anomalies (**FIGURE 1**).

Dr. Cooper’s original model has persisted, refined according to regional patient needs.¹⁸⁻²¹ In 1996, the American Cleft Palate-Craniofacial Association’s Team Standards Committee developed a listing mechanism for craniofacial teams (CFT) and cleft palate teams (CPT). Although not all patients require every type of specialist, most teams today, including our craniofacial team at Children’s Hospital Los Angeles (CHLA) (**FIGURE 2**), consist of the following:

- A pediatric dentist and dental prosthodontist to fabricate prosthetic devices and provide oral health care;
- An orthodontist to address the special needs for tooth and jaw alignments to achieve optimal occlusion;
- A speech-language pathologist or therapist to assess not only speech and language acquisition but also feeding problems;
- An audiologist to assess hearing;
- A geneticist to screen patients and families for craniofacial syndromes

The more these teams are aligned with a shared perspective, the more they model the best of communication, cooperation, collaboration and coordination.

and to convey the risk of having more children with these conditions;

- A registered nurse to help with feeding problems and to provide supervision of the child’s health;
- A pediatrician, often serving as the “quarterback” of the craniofacial team, to assess and monitor the child’s overall health and development;
- An otolaryngologist to assess and treat ear, nose and throat issues;
- A clinical psychologist, social worker, and/or mental health specialist to support the patient and family and to screen for behavioral and developmental concerns;
- An ophthalmologist to assess the patient’s vision and related concerns; and

- Other necessary specialists (e.g., nutritionist) to treat specific aspects of complex craniofacial anomalies. Recent analyses have discovered that hospital-based craniofacial teams reduce Medicaid costs for craniofacial malformations and syndromes.¹⁹

As specialists align and concentrate on the special needs of the child and family, and as they contribute to sequenced, developmentally appropriate and coordinated treatment planning, they achieve a unique focus on the development of the child, thereby providing comprehensive, quality health care. The more these teams are aligned with a shared perspective, the more they model the best of communication, cooperation, collaboration and coordination. By alignment, we mean that each team member understands the entire treatment plan, sequence and desired outcomes of health care. In highly effective teams, quickly reaching decisions is paramount and saves expenses.^{18,19}

This approach not only addresses the needs of patients with congenital craniofacial anomalies and syndromes, but also benefits patients with acquired craniofacial diseases and disorders, such as those resulting from trauma, infectious diseases, severe facial burns, and head and neck cancers.^{8,9,14,18,20,21}

Yet another development in craniofacial care is owed to the Pennsylvania State Milton S. Hershey Medical Center at Hershey, created in 1963 by the M.S. Hershey Foundation and the Pennsylvania State University.^{20,21} It serves as a regional resource with the capacity to provide a multidisciplinary approach to the diagnosis and treatment of both benign and malignant diseases of the head and neck region, including congenital and acquired craniofacial anomalies, hearing

and balance disorders, maxillofacial trauma, cosmetic and reconstructive facial problems, speech and voice disorders, and surgical endocrine (thyroid and parathyroid) disorders.^{20,21} In the Hershey model, the team comprises individuals who have an interest and expertise in addressing craniofacial-oral-dental diseases and disorders over the entire lifespan. This system also furnishes an innovative approach to controlling costs while providing the benefits of a craniofacial team.

Interprofessional Teams Engaged in Clinical and Translational Research and Patient Care

Many qualified health professionals who care for children and adults with congenital and acquired craniofacial anomalies have been educated and trained thanks to the leadership skills of a relatively small number of extraordinary people, working with state, federal and foundation funding programs from the late 1930s to the present. Arguably, the major catalyst has been the National Institutes of Health (NIH) through the National Institute for Dental and Craniofacial Research (NIDCR) (formerly the NIDR or National Institute for Dental Research), founded in 1948, along with the National Institute of Child Health and Human Development (NICHD) and the National Institute of Neurological Diseases and Blindness (NINDS), founded in the early 1960s. These three NIH institutes and the March of Dimes have been instrumental in funding basic, translational and clinical research while providing a variety of funding mechanisms for training biomedical research scientists.^{8,22}

In 1964, the Extramural Grant Program allocated funding for the largest clinical research center in the nation, which was directed to Dr. Cooper's study of cleft lip and palate at the Lancaster

Cleft Palate Center. A grant of \$428,000 allowed a seven-year study of cleft palate and cleft lip from causation to diagnosis, treatment and outcomes for patients and their families.^{8,22} From 1957 through 1966, the NIDR awarded more than \$8 million for 68 extramural research projects, 33 of which included studies of speech and hearing. An additional \$4 million was provided by other federal agencies and foundations to support studies of congenital craniofacial anomalies during this period.^{8,22}

In 2003, Mark Urata, MD, DDS, and

Clinicians and researchers alike stood behind the motto "working toward putting ourselves out of business."

Yang Chai, DDS, PhD, collaborated to create one of the largest craniofacial teams in the nation, the Center for Craniofacial Molecular Biology (CCMB) at the Herman Ostrow School of Dentistry of the University of Southern California. Thereafter, research laboratory meetings at CCMB included surgeons, pediatricians and clinical geneticists such as Pedro Sanchez, MD. Likewise, research graduate students, postdoctoral fellows and residents were invited to the operating rooms at CHLA. Such cross-pollination led to better communication and cooperation, earned multidisciplinary-based NIH grants and also modeled medical and dental students, postdoctoral fellows, medical and dental specialty residents and faculty engaged in patient-centered health care.

Further, the CHLA Craniofacial and Cleft Center expanded to become one of the largest centers in North America, with five full-time surgeons. The craniofacial plastic surgical fellowship became a flagship program and was joined by a craniofacial orthodontic fellowship program directed by Stephen Yen, DDS, PhD. Clinicians and researchers alike stood behind the motto "working toward putting ourselves out of business."

This interprofessional team provides care for children with congenital malformations, traumatic injuries and complex medical treatments. In addition to patient care and residency training, the team engages in biomedical research to identify the underlying causes of these conditions and to develop and improve treatment options and outcomes for patients and their families. One example is the fundamental and translational research infrastructure provided by CCMB faculty and supported by the NIH, primarily from the NIDCR. Dental and medical students, residents and doctoral candidates and postdoctoral fellows are mentored as they pursue answers to a number of significant clinical questions associated with gene-based diagnosis and prognosis (systems and computational biology, genotype versus phenotype), imaging, regenerative dentistry and medicine and improved clinical outcomes (e.g., stem cell therapy, rescue of inherited genetic defects, tissue and organ regeneration, synthetic biomineralization). Dr. Chai and his colleagues are also active participants in the national FaceBase consortium supported by the NIDCR.

Prospectus

Today, there are well over 250 cleft palate and craniofacial-oral-dental clinics and multidisciplinary teams (interprofessional teams) in the U.S. and Canada.^{7,14,18,22} The challenge these

teams face is to optimize communication, cooperation, collaboration and coordination among specialists, research scientists, and between specialists and patients and families. This applies not only to issues of congenital malformations, but also to the challenges of an array of acquired diseases and disorders of the craniofacial-oral-dental complex, such as head and neck trauma and cancers. The multidisciplinary craniofacial team collectively addresses the medical, dental, physical and psychosocial needs of the child and family, providing comprehensive, continuous and cost-effective health care.¹⁹

As with interprofessional craniofacial teams, multidisciplinary biomedical research teams are also required to address the intricate and interconnected complexities of basic and translational biomedical research.^{8,22,32} A recent exemplar is the “teams” assembled for the Human and Microbial Genome Projects that include microbiology, molecular biology, human genetics, developmental biology, biochemistry, pharmacology, anatomy, physiology, engineering, bioinformatics, mathematics, physical anthropology, physicians, dentists, pharmacists, nurses, etc. This concept was not always recognized or embraced. Historically, many clinicians and scientists were trained to function exclusively within their disciplines and often perceived themselves as “solo acts.” During most of the 20th century, rewards and recognition for achievement were often discipline-based and individual, such as receiving academic tenure in a university, serving as principal investigator on a research grant, becoming “boarded” in a clinical specialty and serving as director or chair of a clinical discipline, scientific department or program.

The evolving nature of health problems requires a diversity of expertise, not just one scientist working in one laboratory

using one dominant technique.^{8,9,23} Solutions to complex problems in clinical medicine and dentistry, evolutionary and developmental biology, or cellular and molecular biology demand leadership that inspires international relationships.^{8,23,33-36} As education and training that reflect collaborative approaches increases, more cross-disciplinary, peer-reviewed scientific publications, workshops and conferences emerge, accompanied by more competition for research funding. Meanwhile, public as well as private institutions and organizations struggle

The evolving nature of health problems requires a diversity of expertise, not just one scientist working in one laboratory using one dominant technique.

to provide appropriate recognition for group or team achievements.

Technological, demographic, social and economic forces continue to have a significant impact on access to and affordability of comprehensive, quality health care, from prenatal through hospice care. Meeting the public's comprehensive health and quality-of-life needs in the coming decade will require transformational leadership and profound revisions of the entire health care enterprise. Many futurists assert that gaining synergy within and between health professional schools, departments and programs (e.g., medicine, dentistry, pharmacy, nursing, physical and occupational therapy, speech therapy, dental hygiene, etc.) will be the key to optimizing the

health care workforce and meeting society's changing health needs.²⁵⁻²⁹

The biological and digital revolutions have yielded remarkable advances that have profoundly influenced health care. Genomics, post-genomics and the dividends from the transcriptome, proteome, metabolome and microbiome, with accompanying bioinformatics, information technology and imaging, are shaping health care in the 21st century.^{37,38} In tandem, health disparities based upon socioeconomic determinants have also been illuminated. These “drivers” add complexity to achieving effective leadership in biomedical, behavioral and social sciences and technology. Success in these endeavors often depends on cooperation and collaboration across “different ways of knowing,” or so-called multidisciplinary, interdisciplinary or transdisciplinary team approaches. Leadership in these fields of inquiry requires organizing highly creative people who are motivated by common goals and incentives into effective collaborative groups or teams.³³⁻³⁸

Today, our national debate over access to health care and education for all people continues. Some argue that education should be an entitlement for early child development and preschool as well as K–12 education. Others debate whether a defined health care benefit should be an entitlement for children and the elderly living under the poverty line versus considering health care as a purchase. These deliberations will likely continue well into the future. As we have learned during the last decade, predicted as well as unanticipated change must be part of business plans and national policies. Numerous social, economic and political factors will continue to shape many directions for change.

Communities that present excessive burdens of disease based on socioeconomic determinants will increasingly require

a culturally competent health care workforce emphasizing health literacy, health promotion, disease prevention and risk assessment to reduce health disparities in America. This is particularly apparent for congenital as well as acquired craniofacial diseases and disorders. Seventeen years ago, Surgeon General C. Everett Koop issued a comprehensive report on children with special health care needs, which included eight themes that championed interprofessional teams :

- Facilitation of parent/professional collaboration in the health care of children;
- Sharing of unbiased and complete information about children with their parents;
- Provision of emotional and financial support for families;
- Sensitivity to cultural differences;
- Encouragement of parent-to-parent support;
- Incorporation of the developmental needs of infants, children and adolescents into health care plans;
- Assurance of the availability of comprehensive services including social, emotional, and cognitive aspects of health care; and
- An interprofessional approach to care.³⁹

Meeting the health and wellness needs of society in the 21st century will require an educated and trained, culturally diverse health care workforce (e.g., educators, clinicians, scientists, engineers, sociologists, psychologists, law and public policy, business, philanthropy and journalism). At this time, a number of public- and private-sector interprofessional health care teams that include oral health care providers are forming to address the needs of underserved populations presenting with extreme health disparities. As we envision the future, four major characteristics of interprofessional team health care are offered:

- Moving away from volume-based, fee-for-service reimbursement to performance-based, outcome-based value that rewards safe, efficient and high-quality health care;
- Placing the patient and his or her family first by rewarding health care professionals to enable continuous improvement in quality and safety, using evidence-based guidelines for comprehensive health care;
- Empowering interprofessional health teams to utilize tools that provide access to large data, appropriate

Meeting the health and wellness needs of society in the 21st century will require an educated and trained, culturally diverse health care workforce.

funding and analytical expertise in order to effectively and efficiently manage patient populations; and

- Encouraging interprofessional health teams to create proactive collaborations with local communities, individuals, employers and other stakeholders involved in support of health communities.

One such recent innovation is the creation of The Wellness Centers by the Los Angeles Trust for Children's Health (The L.A. Trust) in partnership with the Los Angeles Unified School District (LAUSD) and other stakeholders and funders (e.g., DentaQuest Foundation, UCLA/Rand Prevention Research Center and Eisner Pediatric and Family Medical Center). The L.A. Trust defines wellness to be the result of holistic physical, oral

and mental health care, nutrition, social services and lifestyle choices. It is realized through education, prevention, diagnosis and interprofessional health care. The mission of these multiple Wellness Centers, which are located on school campuses, is to form networks that can remove barriers and empower students and their families and communities to become successful citizens through integration of oral, mental and physical health. For more information go to thelatrast.org.

Clearly, the opportunities to achieve comprehensive wellness are compelling, but they require significant revisions in graduate and professional school education (systems approaches, information technology infrastructure and bioinformatics, computational biology, systems biology, pharmacology coupled with pharmacogenomics, human and microbial genomics and a greater understanding of human social, economic and behavioral sciences). These changes are imperative to ensure a better quality of life for all people in California and beyond.⁴⁰⁻⁴⁹

Dr. Cooper began something very significant. It seems like yesterday when he created one of the first interprofessional health care teams, yet it is a call to action for today and the future. ■

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Interprofessional Practice in the Era of Accountability

Paul Glassman, DDS, MA, MBA

ABSTRACT A large and increasing segment of the population does not access the traditional oral health care system until they have advanced disease, pain and infection. Opportunities for improvement of this situation include applying new science in chronic disease and caries management, using community-based telehealth-connected teams, emphasizing interprofessional practice by integrating oral health into educational, social service and general health systems, and focusing attention on oral health outcomes in the era of accountability.

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The U.S. oral health industry is facing tremendous pressure to change. A large and increasing segment of the population does not access the traditional oral health care system until they have advanced disease, pain and infection. In fact, as illustrated in the **TABLE**, Medical Expenditures Panel Survey data indicate that 52 percent of dental care in the U.S. is purchased by the those with the top one-third of family incomes, with those in the bottom one-third purchasing only 19 percent of dental services.¹ Unfortunately, those groups in the bottom income strata, along with individuals who have complicated health issues, dependent elders and members of racial and ethnic minority groups have most of the dental disease.^{2,3} This means that dentists are increasingly treating the wealthiest and healthiest segments of the population, while

those with the highest rates of disease go largely untreated until they have advanced disease, pain and infection.

One result of these dramatic shifts in the dental care landscape is that both visits to dental offices and dentists' incomes are decreasing.⁴ Visits to general dental offices have steadily declined over the last decade by a total of 10 percent starting in 2003, well before the recent recession, and continuing well into the recovery. The ADA Health Policy Resources Center has cautioned the profession not to expect a return to previous periods of increasing growth and has described these declines as "the new normal."⁵

In spite of decreasing demand, the price of dental care continues to rise. As illustrated in **FIGURE 1**, the Consumer Price Index for Dental Services (CPIDS), a marker of the average price of dental care for the average person,

rose at twice the rate of the Consumer Price Index (CPI), the general rate of inflation, between 2000 and 2011.⁶ This is unfortunate because dental care is far more price sensitive than general health services. As depicted in **FIGURE 2**, as a nation we pay more for dental services out of pocket more than we pay for any other health service except prescription drugs.⁷ High out-of-pocket costs and increasing prices in the face of falling demand help explain why dental care is the health service most likely to be put off by people who believe they need care but don't get it due to cost as a barrier.⁸

The decrease in people accessing dental services, particularly those groups with the majority of the dental disease, has exacerbated the profound health disparities in the U.S. population. These inequities in access and the resulting health imbalances have been well documented. The 2000 report of the U.S. surgeon general stated, "Although there have been gains in oral health status for the population as a whole, they have not been evenly distributed across subpopulations. Profound health disparities exist among populations including racial and ethnic minorities, individuals with disabilities, elderly individuals and individuals with complicated medical and social conditions and situations."² In 2011, the Institute of Medicine (IOM) and the National Research Council of the National Academies of Science issued two reports on oral health: *Advancing Oral Health in America* and *Improving Access to Oral Health Care for Vulnerable and Underserved Populations*.^{3,9} Both of these reports describe the significant proportion of the U.S. population that does not have access to oral health services and the disparities in oral health among these groups. It is clear that the profound oral health deficits

TABLE

Dental Expenditure by Income Strata — 2010

Family income	Number (000,000)	Percent of population	Percent with visit	Expenditures (000,000)	Percent of expenditures
Poor	46.8	15%	24%	\$4,232	7%
Near poor	14.5	5%	27%	\$1,612	3%
Low	42.7	14%	28%	\$5,468	9%
Middle	93.0	30%	35%	\$17,302	29%
High	111.7	36%	51%	\$31,111	52%

Definitions: Poor = < FPL; Near poor = >FPL-125% FPL; Low = >125%-200% FPL; Middle = >over 200%-400%FPL; high = >400% FPL. 2010 FPL for family of 1 = \$10,830, 4 = \$22,050 (HHS Poverty Guidelines 2010, <http://aspe.hhs.gov/poverty/10poverty.shtml>) Source = AHRQ MEPS Dental Services Expenses General Dentist Visits 2010 http://meps.ahrq.gov/mepsweb/data_stats/tables_compendia_hh_interactive.jsp?_SERVICE=MEDSocket0&_PROGRAM=MEPSPGM.TC.SAS&File=HCY2010&Table=HCY2010%5FPLEXP%5FB&VAR1=AGE&VAR2=SEX&VAR3=RACETH5C&VAR4=INSURCOV&VAR5=POVCAT10&VAR6=MSA&VAR7=REGION&VAR8=HEALT H&VARO1=4+17+44+64&VARO2=1&VARO3=1&VARO4=1&VARO5=1&VARO6=1&VARO7=1&VARO8=1&TCOPT1=GEN&_Debug=.

experienced by large segments of the U.S. population as described in the surgeon general's 2000 report have not changed in the 14 years since the release of that report or since the 2011 IOM reports.

The IOM has proposed that one of the principles that should be included in an oral health system better designed to address these profound and increasing health disparities is the use of "collaborative and multidisciplinary teams working across the health care system."³ This statement was based on the conclusion that "the separation of oral health care from overall health care is a factor in limiting access to oral health care for many Americans." Further, the IOM indicated that "oral health is an integral part of overall health, and therefore, oral health care is an essential component of comprehensive health care." These and other statements emphasize the need to increase the use of interprofessional practice as a major strategy in improving oral health.

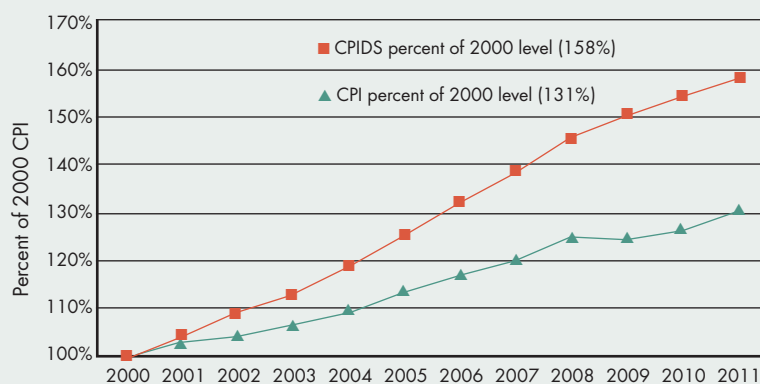
The Era of Accountability

Concurrent with the changing landscape in dental care, the general health care system in the U.S. is undergoing profound changes and has now entered the "era of accountability." This is evident in the decade-long journey from "pay-for-performance" experiments to "accountable care

organizations" established in the Affordable Care Act (ACA), and the current call for "value-based care."¹⁰⁻¹⁷ Many of these efforts have been driven by the need to align incentives with health outcomes. A 2010 Urban Institute report, *Moving Payment from Volume to Value*, highlighted the need to make these changes and to emphasize value for patients.¹⁸ Donald Berwick, MD, former administrator of the Centers for Medicare and Medicaid Services (CMS) and former president and chief executive officer of the Institute for Healthcare Improvement, has referred to the goals of this journey as the "Triple Aim."¹⁹ The three aims are improving the experience of care, improving the health of populations and reducing per capita costs of health care.

The major drivers of change in the general health care system include:

- The skyrocketing cost of health care unrelated to improvement in health outcomes.
- Increasing understanding of the harm and unwarranted variability produced by our fragmented health care system.
- Evidence of the profound health disparities that still exist in the population in spite of scientific advances in care.
- Increasing awareness of these problems in the age of consumer empowerment.



Source: American Dental Association. Consumer Price Index for Dental Services, 1970–2011. March 2012.

FIGURE 1. Oral health expenses. Consumer Price Index for Dental Services versus Consumer Price Index, 2000–2011.⁶

The Skyrocketing Cost of Health Care and the Poor Return on Investment

There is evidence that as a nation we spend much more per capita and much more of our gross domestic product on health care than the rest of the developed world, and in spite of this spending we have poorer health outcomes.^{20–23} In addition, the 1999 and 2001 IOM reports, *To Err Is Human: Building a Safer Health System* and *Crossing the Quality Chasm*, highlighted problems with the U.S. health care system in the areas of patient safety, inefficient use of resources, fragmentation of the delivery system and the need to redesign the way health care is delivered.^{24,25} Finally, there is wide evidence that our health care system produces serious inequities in the delivery of care and in health outcomes, with certain populations being less able to access health care services and having significantly poorer health than other segments of the population.^{26,27}

Unwarranted Variations in Health Outcomes and Health Disparities Among Populations

The oral health care system mirrors the general health care system with a large variability in treatment recommendations not based on scientific evidence. Bader and others have described the limited evidence that exists for most procedures

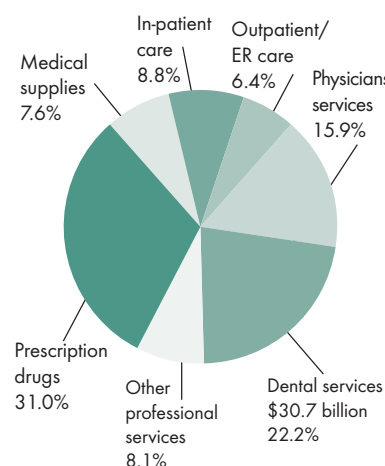
performed in oral health care.^{28,29} As a result, there are widespread unexplained variations in clinical decisions among dentists.³⁰ One study that compared six capitated practices with five fee-for-service practices found that average rates of restorative services were higher in the fee-for-service practices — three times as high for adults and four times as high for children. Even when differences in patients are accounted for, variations in dentists' clinical decisions are still widespread.³¹

The Quality Movement

The 2001 IOM report, *Crossing the Quality Chasm*, stressed the high cost of medical errors and the inefficient use of resources in our fragmented system and called for a national strategy to transform the health care system. The report recommends six aims for creating a health care system that is “safe, effective, patient centered, timely, efficient and equitable.”

Ten years after the IOM's call for a national strategy, the U.S. Department of Health and Human Services (HHS), as mandated in the ACA, produced its report, *National Strategy for Quality Improvement in Health Care*,³² which sought to accomplish three broad aims similar to the Triple Aim:

- Better care: Improve the overall quality by making health care more patient centered, reliable, accessible and safe.



Out-of-pocket health care total: \$138.5 billion

Source: Bureau of Labor Statistics. Consumer out-of-pocket health care expenditures in 2008. bls.gov/opub/ted/2010/ted_20100325.htm.

FIGURE 2. Consumer out-of-pocket health care expenditures in 2008.

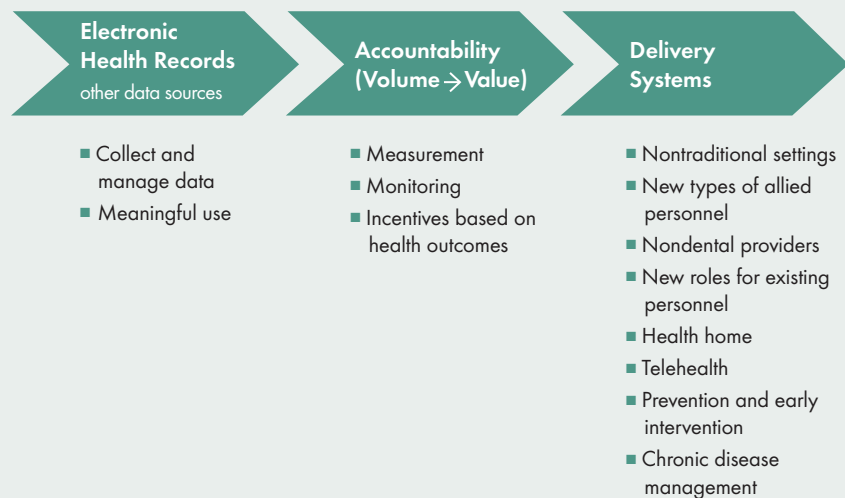
- Healthy people/healthy communities: Improve the health of the U.S. population by supporting proven interventions to address behavioral, social and environmental determinants of health in addition to delivering higher-quality care.
- Affordable care: Reduce the cost of quality health care for individuals, families, employers and government.

Quality Improvement Activities in Oral Health

The factors described here are driving the oral health system in the same direction that general health is being driven — toward increased measurement of the outcomes of oral health activities, using data to improve quality and lower costs and moving incentives from *volume* to *value*.³³ Many groups and individuals are engaged in developing or using oral health measures and in oral health quality improvement activities. They can be categorized by sectors of the oral health industry. A summary and examples of these groups include:

- Federal or National Agencies and Programs
 - The National Quality Forum (NQF)^{34,35}
 - The National Priorities Partnership (NPP)^{36,37}
 - Healthy People 2020^{38,39}
 - The Agency for Healthcare Research and Quality (AHRQ) National Healthcare Quality and Disparities Reports⁴⁰
 - The AHRQ National Quality Measures Clearinghouse (NQMC)⁴¹
 - The AHRQ National Guideline Clearinghouse⁴²
 - The Consumer Assessment of Healthcare Providers and Systems (CAHPS) Program⁴³⁻⁴⁵
 - The National Committee for Quality Assurance (NCQA)⁴⁶
 - NCQA's Healthcare Effectiveness Data and Information Set (HEDIS)⁴⁷
 - Medicaid's Early and Periodic Screening, Diagnostic and Treatment (EPSDT) program⁴⁸
 - The Children's Health Insurance Program Reauthorization Act of 2009 (CHIPRA)⁴⁹
 - The Indian Health Service⁵⁰
 - Military Dental Services⁵¹
 - The Department of Veterans Affairs' Oral Health Quality Initiatives
 - The Medicaid/State Children's Health Insurance Program (SCHIP) Dental Association and State Medicaid Departments^{52,53}
 - The Oral Health Safety-Net⁵⁴
 - Large Group Dental Practices^{55,56}
 - The Dental Benefits Industry⁵⁷
 - Professional Dental Associations⁵⁸
 - Hospital-based Dental Practices⁵⁹
 - Dental Practice-based Research Networks⁶⁰
- One significant effort is being made

Moving Oral Health Care from Volume to Value*



*Value=health outcomes achieved per dollar spent over the lifetime of a condition.

FIGURE 3. Moving oral health care from volume to value. (Figure courtesy of Paul Glassman, DDS, MA, MBA, reproduced with permission.)

by a National Oral Health Quality Improvement Committee composed of national leaders from dentistry, medicine, academia, business, government and philanthropy who are tasked with developing a roadmap for an oral health care system that improves the oral health of all, using the tools of quality and accountability.⁶¹ This high-level, broad stakeholder group has produced a report entitled *Vision for the U.S. Oral Health System for 2023*,⁶² which is the basis for a *10 Year Roadmap to Improve the Oral Health of All Using the Tools of Quality and Accountability*. This effort complements that of other groups such as the American Dental Association's Dental Quality Alliance, which is now focused on developing measures. The National Oral Health Quality Improvement Committee effort focuses on using measurement and incentives to drive change that will improve the oral health of the population.

This group has reached the same conclusion reached by the IOM, that “increased integration with the overall health care system and education and social

service systems is essential.” Again, these conclusions emphasize the need to increase the use of interprofessional practice as a major strategy in improving oral health.

Future Trends in Oral Health Quality Measurement, Improvement and Delivery Systems

The U.S. health care system has entered the era of accountability. As described above, the drivers of change include concern about the rapidly increasing costs of care and unwarranted variability in costs and outcomes as well as recognition of profound health disparities among racial and ethnic minorities, low-income populations, people with disabilities and other vulnerable populations. These drivers are pushing the health care system to make progress on the triple aims of improving the experience of care, improving the health of populations and reducing per capita costs of health care. These instigators of change apply not only to general health care, but to oral health care as well. The rapidly increasing cost of care, the large numbers of people

who cannot or do not take advantage of the oral health delivery system, unwarranted variability in care and the existence of deep disparities in oral health among segments of the population are attracting increasing attention. Many organizations are beginning to take action. **FIGURE 3** illustrates steps being followed and the consequences of the change from the current emphasis on volume to an emphasis on value. The diagram depicts the growing use of electronic health records in oral health care and the increasing ability to collect and manage data and to use it to improve care systems, referred to as “meaningful use.” As these processes enhance the measurement and monitoring of outcomes and use, incentive systems based on oral health outcomes are being developed and deployed.

The use of a payment system based on oral health outcomes is shifting incentives from those based on volume to those based on value. This change brings the oral health system squarely into the era of accountability. As value-based incentives continue to be employed, profound change in oral health delivery systems will occur. If value-based incentives are in place and payment is tied to the oral health of the large numbers of currently underserved people, there will be increasing focus on improving the oral health of these populations. The IOM proposed a number of recommendations and potential strategies that are depicted in **FIGURE 3**.³ Among those already being considered, tested or deployed are:

- *Deliver oral health services in nontraditional settings.* This is sometimes referred to as bringing oral care “where underserved people are,” be it in Head Start centers, schools, residential facilities, nursing homes, day programs or other community locations.

- *Expand the oral health workforce.* Strategies being tested include creating new categories of oral health professionals or expanding the scope of practice for current oral health professionals to ensure they are being used to the extent of their education and experience.
- *Use nontraditional providers.* Many significant local and national efforts are under way to engage general health professionals in interprofessional practice activities that will improve oral health and integrate it into the systems in which these professionals work. An example of aligning the core competencies between dentistry and nursing is found at New York University, where dental and nursing education and practice have been integrated.⁶³
- *Develop integrated health homes.* What began as a description of the “medical home” and then a “dental home” has broadened to consideration of integrated “health homes” where dental health services are integrated with those delivered in general health, social service and educational settings by professionals in those disciplines, with an emphasis on interprofessional practice.
- *Employ telehealth technologies.* Telehealth systems are making it possible for dental practices to expand their reach to communities of people not traditionally served in dental offices and clinics. This is being accomplished through the formation of geographically distributed telehealth-connected oral health teams functioning in community locations.
- *Use tools of chronic disease management.* There is growing

realization that the oral health industry has been focused on surgical intervention while the major dental diseases, caries and periodontal disease, are chronic diseases. A growing science of chronic disease management emphasizes behavioral, medical and social tools to help individuals and communities partner in managing chronic diseases. To be effective, these strategies require community engagement and interprofessional teams.⁶⁴

- *Emphasize prevention and early intervention.* Preventing or at least intervening early in oral disease with minimally invasive methods will be an increasingly important tool for the oral health industry in the era of accountability. Again, this strategy requires the use of interprofessional teams to be effective.

Interprofessional Practice and Virtual Dental Homes

An example of emerging oral health delivery systems that incorporate the principles presented by the IOM is the virtual dental home (VDH) demonstration project in California.⁶⁵ The VDH system, developed by the Pacific Center for Special Care at the University of the Pacific, Arthur A. Dugoni School of Dentistry (Pacific), brings prevention and early intervention oral health services to underserved groups of children and adults. This four-year demonstration project has shown that telehealth-connected oral health teams, integrated into interprofessional groups in educational, social service and general health systems, can reach children and adults in Early Head Start and Head Start programs, elementary schools, residential facilities for people with disabilities, nursing homes and community centers who might otherwise

not receive dental care until they have advanced disease, pain or infection.⁶⁶

The VDH system utilizes telehealth technology to link allied dental personnel in the community with dentists in offices and clinics. It keeps people healthy by providing education, triage, case management, preventive procedures and interim therapeutic restorations. Where more complex dental treatment is needed, the VDH connects patients with appropriate dentists in the area. The system also links patients and dental providers with interdisciplinary teams. Most important, it brings much-needed services to individuals who might otherwise receive no care.

This system promotes collaboration between dentists in dental offices and clinics and community-based dental hygienists and dental assistants. It promotes integration of dental care and interprofessional practice into educational, social service and general health systems. Allied dental personnel in these community sites interact on a daily basis with administrators, family advocates in Head Start preschools, teachers, school nurses, nursing assistants and physicians in long-term care facilities and residential facilities for people with disabilities, and social services staff. All these efforts recognize the reality that changing individual behavior and improving daily mouth care are essential components in increasing oral health, and this cannot be done in the isolation of dental offices. Interprofessional teams and community engagement are essential for success.

Pacific's VDH demonstration project has shown that the oral health system can increase the number of patients receiving care and better integrate dental care into overall health care without additional investment in costly infrastructure. This system provides tremendous potential for expanding the reach of existing oral health care providers across the country.

Conclusions

The oral health care system has entered an era of significant change. Dental professionals of the future will need new background and skills to function in the evolving delivery systems. Dental practices in the future are likely to:

- Use geographically distributed telehealth-connected oral health teams.
- Emphasize tools of chronic disease management, including biological, medical, behavioral and social tools.
- Integrate with general health, educational and social service interprofessional care teams and systems.
- Use the strategies above to interact with the majority of the population.
- Focus on oral health outcomes in the era of accountability.

Dr. Berwick, in *The Triple Aim: Care, Health and Cost*, said that the barriers to achieving the Triple Aim in the U.S. health care system “are not technical, they are political.”¹⁹ While technical barriers to achieving the Triple Aim in oral health care may still exist, many of the barriers are also political. The developments described here will take concerted efforts by many individuals and groups: government at the federal, state and local levels, organized health professions, individual health care providers, the dental and general health benefits industry, private philanthropy and consumer groups. The 2000 report of the surgeon general, *Oral Health in America*, and the recent reports from the IOM elevated the visibility of oral health disparities in the U.S. Now, the pressures and opportunities arising in the era of accountability will pave the road to address these issues. ■

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Navigating Dental Benefits

CDA Practice Support

The Dental Benefits Workshop (DBW), the first of several Smart Dentist Trainings, took place March 20-21, 2014, in Sacramento at the California Dental Association headquarters. The two-day workshop was a pilot program for CDA and one of several member educational initiatives undertaken by CDA Practice Support in 2014. The pilot DBW was attended by 39 dentists, each with a team member from his or her dental practice. The attending dentists were hand selected from more than 100 applicants to participate in the preworkshop webinar and survey, attend the two-day program and then participate in postworkshop webinars and surveys. The workshop and preworkshop webinar included guest speakers from the dental benefits industry as well as practice management consultants, attorneys and an electronic billing expert who addressed the following topic areas:

Dental Benefits Today Versus Tomorrow, presented via webinar by Michael Perry, DDS, covered the evolution of dental care spending, patient utilization and dental benefit coverage and how this evolution has impacted dental care models, dentist earnings and consumer responsibility.

Nicette Short, director of policy development at CDA, provided an overview of the goals and legal requirements of the Affordable Care Act (ACA) and the projected impact of ACA implementation to consumers, employers and health care providers during her webinar presentation *Understanding the Affordable Care Act's Impact on Dentistry*.

Dental Plan Sales and Administration, presented by Charles Stewart, DMD, addressed the differences in dental plan design and functionality, network contracting and dental plan sales.

Practice Model Selection, presented by Dr. Perry assisted participants with evaluation of their current dental business model and identified the differences between profitability between business models.

Smoke and Mirrors in Dentistry, a program offered by Dr. Stewart, equipped attendees with information and examples of improper coding, questionable billing and the ability to recognize the importance and implication of misrepresentation on a dental practice.

Presented by attorneys Felicia Sze and Katrina Pagonis of Hooper, Lundy

& Bookman PC, the *Provider Contracting* program informed attendees of the important elements of provider and dental plan agreements, how to evaluate compensation and reviewed governing law for provider contractual agreements.

Scott Wellwood, president of EDI Health Group Inc., discussed the current trends in electronic data interchange and how dental practices can benefit using electronic data interchange and electronic attachments.

Liberty Dental Plan's National Dental Director Gary Dougan, DDS, MPH, educated attendees on some of

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BAKERSFIELD #28 – WOW! Part time General Practice, (2) Free Stand. Bldgs., & Approx an Acre of Prime Commercial Land for sale. Located on a main thoroughfare w excell. exposure/visibility/signage, & parking. Seller passed away. Subject to court approval. **NEW**

CALABASAS – Highly sought after but seldom found, upscale Shop. Ctr. location w excellent exposure, visibility, & signage. Newer build out. Mostly Fee for Service. (4) ops of newer eqt. Digital Pano & X-rays, Central Nitrous, & Dentrix. Annual Collections of \$525K+. **PENDING**

CAMARILLO – (5) op comput. G.P. located in a prof. bldg. with signage. (40+) years of Goodwill. 2013 Gross Collect. \$525K+ on a (4) day week. Newer eqt., digital X-rays, soft tissue laser, & Pano. Cash/Ins/PPO. No Denti-Cal or HMO. Seller moving out of state. **PENDING**

EAST VENTURA COUNTY #2 – Free Standing Bldg. & (3) op comput. G.P. 2013 Collections of \$561K+. Cash/Ins/PPO/HMO pt. base. Mos. Cap. Ck. of \$2K+. (28+) new pts./mos.

HOLLYWOOD – Excell. Starter or Satellite Office. (3) ops. Comput. Collect \$100K+ p.t.

LOS ANGELES – Upscale, (4) op turnkey office. Just built out & eqt'd w new eqt. Located in a new shop. ctr. on a main thoroughfare. Excell exposure, visibility, & signage. All the preliminary work is done. Just bring your instruments & supplies, & build your upscale practice! **PENDING**

RANCHO BERNARDO #1 – TURNKEY OFFICE. Everything you need to see pts. (5) op comput. G.P. located on the 1st floor of a well known Office Plaza w easy fwy access. **NEW**

RANCHO BERNARDO #2 – For Lease. Built out Oral Surgery Suite. (2) exam rms, (2) surgery rms & a recovery area. Also has private office w shower, reception, biz ops, steril, patient rest room, & employee area. 1st floor location in a well known Office Plaza w easy fwy access. **NEW**

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

SIMI VALLEY – (4) op comput. G.P. w digital X-rays & pano. (2) ops eqt'd, (2) add. plumbed. Turnkey office w some charts. Located in a shop. ctr. w exposure/visibility/signage. **PENDING**

VAN NUYS/SHERMAN OAKS – Free Standing Bldg. & (4) op comput. G.P. located on a main thoroughfare. Cash/Ins/PPO. 50+ yrs of Goodwill. Collect \$425K+/yr. Seller retiring. **PENDING**

WEST SAN FERNANDO VALLEY – (4) op comput. G.P. w modern equipt. Located in a smaller prof. bldg. on a main thoroughfare. Cash/Ins/PPO pts. Annual Gross Collect \$750K+ on a (4) day week. Excell. long term lease, outstanding signage, & great off street parking. **NEW**

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the most common issues that cause dental claim denials of payment and how to employ defensive dentistry through accurate charting and billing.

Dr. Perry gave the final presentation of the workshop on the importance of effective communication from the dental practice to patients regarding dental benefits.

Based on the success of the pilot workshop, two additional Dental Benefit Workshops will be offered next year, April 16-17, 2015, in Sacramento and Oct. 22-23, 2015, in Orange County. Registration information will be posted on cda.org when it is available. ■

Web user account required for C.E. transcripts

Members attending CDA Presents are now required to have a web user account on cda.org in order to obtain copies of C.E. transcripts after the convention.

CDA has implemented a new association management software system that enables CDA to update and streamline processes.

This new software system requires members to either create a new user account, or set their new password for existing accounts, in order to access Practice Support resources, e-learning courses, the CDA Store and online dues renewal on cda.org.

Go to cda.org/password and follow a few easy steps to establish a web user account.

If you have any questions, please contact CDA at 800.232.7645.

Make 'Reasonably Careful' Plans, Then Vacation

TDIC Risk Management Staff

If a little rest and recreation is on your schedule, The Dentists Insurance Company wishes you bon voyage and offers a reminder to make “reasonably careful” arrangements for emergency patient care while you are out of the office.

TDIC recommends lining up emergency coverage with one or more of your colleagues, notifying patients at least one month before vacation and providing information about the dentists who will provide care in your absence. Inform patients of the colleagues' emergency contact information on your website and via a sign in your waiting room. If you are closing for vacation, leave a message on your telephone with emergency contact information. If you use an answering service, leave specific directions for the operator to collect information from the patient, including full name, date last seen, complaint and telephone number. Meet with colleagues in advance to discuss verification of patients of record and provide a referral list of specialists you routinely use to ensure continuity of care.

“There are circumstances, such as vacation, where dentists should have a policy or protocol regarding emergency or similar after-hours care,” said John Sillis, a Northern California attorney specializing in professional liability. The key is whether the dentist is being “reasonably careful” to make sure patients are taken care of while he or she is out of the office.

Sillis said the phrase “reasonably careful” is in the definition of standard of care. A dentist can be negligent if he or she fails to use the level of skill, knowledge and care in diagnosis and treatment that other reasonably careful dentists would use in the same or similar circumstances.

The key is whether the dentist is being “reasonably careful” to make sure patients are taken care of while he or she is out of the office.

“‘Reasonably careful’ is frequently defined as whether the dentist’s action or omission caused the patient injury,” Sillis added. “Develop a protocol to protect yourself and your patients while you are on vacation.”

In addition to arranging for emergency patient care, schedule someone to check your mail for urgent or time-sensitive letters from patients, the Dental Board or an attorney.

Another option for vacation coverage

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You are a dentist deserving of an insurance company relentless in its pursuit to keep you protected. That’s how we see it at The Dentists Insurance Company, TDIC. Take our free, discreet, Risk Management Advice Line. It’s insight and advice when you need it most. Ultimately, we’re in your corner every day that you are in this profession, because with us, you’re not a policy number. You are a dentist.

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Dave Reynaud, DDS



Doug Reid
 California Broker
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Robert Stanbery
 Owner

is to hire a dentist to work in your practice while you are gone. If considering this option, TDIC recommends verifying the active license and insurance of the covering dentist. Make sure this dentist follows your protocol for charting entries and has the skill level you expect of someone who is going to treat your patients. Carve out the time to discuss practice philosophies such as the dentist's availability to respond directly to patient concerns in the event of an emergency procedure, such as an extraction or root canal therapy. Again, provide a referral list of specialists. Meet with staff to plan for a smooth transition for the covering dentist and leave your contact information.

Vacation checklist:

If closing your practice for vacation:

- Arrange for emergency coverage with one or more colleagues.
- Notify patients one month in advance of vacation and provide emergency contact information.
- Leave emergency contact information on your website and answering machine.
- Develop a protocol for verification of patients of record.
- Provide a referral list of specialists.
- Schedule a daily mail check for urgent or time-sensitive matters.

If your office is open and another dentist is covering for you:

- Verify an active license and insurance of the covering dentist.
- Ensure the covering dentist's documentation and skill level meets your expectations.
- Discuss practice philosophies regarding emergency care and availability.
- Meet with staff to plan for a smooth transition.
- Leave your contact information. ■

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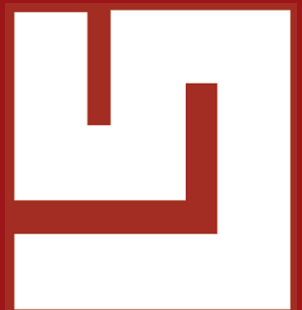
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BANNING: NEW LISTING! General Dentistry, 6 Ops with room for expansion. Paperless, digital, EagleSoft. 8 days of hygiene/week. 2013 GR over \$1.5MM.

BEVERLY HILLS: General Dentistry with heavy emphasis on Perio/Implants, est. 1988. 3 Ops, Pano, ComputerAge. 2013 GR of \$795K with \$371K Adj. Net on 4 days/week. #CA145

CHULA VISTA: General Dentistry, 4 Ops, 3½ days of hygiene, Dentrix software. 2012 GR \$528K. #CA109

COALINGA: General Dentistry, 1,100 sq. ft., 3 Ops, remodeled in 2011. 1,000 active patients. #CA564

COASTAL ORANGE COUNTY: General Dentistry, \$500K spent on 4 new high-end Ops. Dentrix and Dexis, Digital Pan. Close to the ocean - dream location! 2013 GR of \$511K. #CAM566

EASTERN SIERRAS: General Dentistry, 1,650 sq. ft. w/ 4 Ops. '12 GR \$521K. Low 52% overhead. #CA528.

FOLSOM/EL DORADO HILLS: PRICE REDUCED \$31K! General Dentistry, 1,200 sq. ft., 4 Ops. 2012 GR of \$405K. Dentrix, Laser, Digital X-rays, and Intra-oral cameras. #CA103

FREMONT: 3,000+ Sq. Ft. suite, 10 Ops. Digital X-rays, Pan. 4,000 active patients. PPO/HMO. '12 GR. \$1.2MM w/ Adj. Net Inc. of \$300K. #CA553

FRESNO: General Dentistry, 5 Ops, 2,00 sq. ft. in North Fresno. 5 days/hyg, 23 new patients/month. 2013 GR \$789K. Practice started in 1997. #CA171

GRANITE BAY: General Dentistry, 5 Ops., 3 equipped. Dentrix, Digital X-rays, GR \$236K+ as of 12.11.13 on 8 days/month. #CA128—IN ESCROW

GREATER LINCOLN/ROSEVILLE: General Dentistry, 2,150 sq. ft., 3 equip. Ops (2 add'l plumbed). Intra-Oral, Digital X-ray, Laser, Eaglesoft software. 2013 GR \$528K+. #CA165

GREATER LOS ANGELES: NEW LISTING! Perio Practice. 5 Ops, 34 years of goodwill.

GREATER ROSEVILLE/ROCKLIN/LINCOLN: General Dentistry, 1,887 sq. ft., 2 equip. Ops (3 add'l plumbed). 3 days hygiene, Eaglesoft. 2013 GR \$350K+. #CA154

GREATER SACRAMENTO: PRICE REDUCED \$50K! General Dentistry Practice & Condo. 1,300 sq. ft. in prof. bldg. w/4 Ops. Eaglesoft. '13 GR \$679K. #CA138

GREATER SACRAMENTO: General Dentistry, 3,079 sq. ft. office (shared w/2nd dentist - separate practices), 7 Ops, Digital X-ray, Pano, Datacon software. '13 GR \$974K. #CA140

GREATER SACRAMENTO: General Dentistry, 1,600 sq. ft., 5 equip. Ops (1 add'l plumbed). Eaglesoft, E4D, Intra-Oral, Pano. 9 days Hyg/week. 2012 fiscal year GR of \$888K+. #CA156

GREATER SACRAMENTO/ROSEVILLE: Partnership Position in General Dentistry Group Practice. Each partner has own patients. Intra-Oral, Digital X-Rays (Dexis), Digital Pan. Poss. Owner financing #CA126

HAWAII (MAUI): General Dentistry, approx. 1,200 sq. ft. w/ 4 equipped Ops. GR \$636K #20101

HUNTINGTON BEACH: General Dentistry, est. 18 years. Spacious suite with 6 Ops, 3 equipped, 3 plumbed. #CA155

INDIAN WELLS: General Dentistry/TMJ Practice, 4,000 sq. ft. suite. 6 Ops. '11 GR \$350K+ on 1 doctor-day/wk. #CAM530

LA MESA: General Dentistry, 3 Ops, 2,000 sq. ft. in a prof. building. GR of \$396K in 2012 with \$155K Adj. Net. Practice utilizes Dentrix, Laser, and Digital X-Rays #CA127

LONG BEACH: General Dentistry, 8 Ops, 6 Equipped. Associate-run practice with \$1.2MM GR and 8 days of hyg/wk. Dentrix/Dexis. #CA152—IN ESCROW

MURRIETA: NEW LISTING! General Dentistry, 7 Ops, CEREC, Dentrix. 2013 GR over \$1.4MM with \$521K Adj Net. Schick, Dentrix. #CA163

NEWPORT BEACH: PRICE REDUCED! General Dentistry, 3 Ops, newer, high-end equipment, 2012 GR of \$350K on 3½ days/wk. #CAM534

NORTH EAST BAY: NEW LISTING! \$77K: General Dentistry, 7 Ops. in 2,324 sq. ft. Dental Mate software, Intra-oral Camera, Pano X-ray, Digital X-ray. 2012 GR \$885K. Building to be sold with practice. #CA108

NORTH OF SACRAMENTO: General Dentistry, 5 Ops in 2,050 sq. ft. 2012 GR \$1.2M+. Dentrix, Intra-oral Cameras, Digital X-ray, Imaging System, Pano. #CA106

NORTH ORANGE COUNTY: Endodontic Practice with 5 Ops, 3 Zeiss wall-mounted microscopes. Est. 30 yrs. GR \$370K, Adj. Net Inc. of \$172K on 3 day wk. #CAM561

NORTHERN CALIFORNIA: Periodontal Practice. Partnership position. 1,500 sq. ft. w/6 Ops and Dentrix software. Owner financing available. #CA168

NORTHERN CALIFORNIA: Periodontal Practice. 5 Ops with equipment for right or left-handed provider. Eaglesoft software. 2013 GR \$890K+. #CA153

NORTHERN CALIFORNIA: Endodontic Practice. 3 Ops (1 add'l plumbed) in 1,200 sq. ft.. Two Microscopes. Digital. 2013 GR \$319,865 #CA158

NORTHERN CALIFORNIA: Endodontic Practice. 1,021 sq. ft. w/4 equip. Ops, 1 add'l available. Dentrix software. 2013 GR \$337K. Owner retiring. #CA169

ORANGE COUNTY: General Dentistry, 2013 GR of over \$900K and \$393K Adj. Net. Located in a great area in a desirable area of Orange County. #CA132

ORANGE COUNTY: NEW LISTING! Oral Surgery Practice. 5 Ops in a professional building. 2013 GR over \$1.3MM and \$870K Adj. Net. #CA164

ORANGE COUNTY: NEW LISTING! Perio Practice. 6 Ops, 5 Equipped. 2013 GR \$479K with \$164K Adj. Net. Great OC Location near hospital, freeway, and shopping. #CA

PITTSBURG: General Dentistry, 5 Ops, 1,400 sq. ft. w/Pano, Fiber Optics, 12 NP/month, low rent. 3 year avg. GR \$236K w/60% overhead. #CA133

PLUMAS COUNTY: PRICE REDUCED! General Dentistry & Building. 4 equipped Ops, 5 available. Approx. 1,500 active patients. '12 GR \$515K on 32 hr/wk. EZ Dental, Pan., #CA558

REDLANDS: General Dentistry, 3 Ops, Established 48 years, \$364K GR on 3 doctor days and 3 hygiene days per week. #CA160

RIDGECREST: General Dentistry Practice & Building. 1,500+ sq. ft. building, 4 Ops. Small practice grossed about \$175K in '12. #CA523

RIVERSIDE: General Dentistry Practice & Building with emphasis on Implants. 5 Ops, est. over 50 years. 2012 GR of over \$500K. #CA120

SACRAMENTO: General & Specialty Dentistry. Stand-alone, leased office w/2 suites, GP and Specialty, approx.. 4,000 sq. ft. combined, GP has 4 Ops, Specialty has 6 equip. Ops w/3 add'l plumbed. Dentrix, Intra-Oral, Digital X-ray, Pano. 2013 GR \$1.3M. #CA157

SAN BERNARDINO: General Dentistry, 4 Ops, 30+ years goodwill, street sign, average GR \$265K the last 3 years, Dr. is retiring. #CA150

SAN CLEMENTE: PRICE REDUCED! General Dentistry, 3 Equipped Ops, 2 Add'l plumbed. Est. for 10 years. PracticeWorks, digital x-rays and Pano. #CA129

SAN DIEGO: General Dentistry, 5 Ops in a 1,200 sq. ft. suite. EagleSoft, digital x-rays, est. for 22 years. 2012 GR of \$442K with \$161K Adj. Net. #CA130

SAN DIEGO: NEW LISTING! General Dentistry. 3 Ops in a central area of San Diego with 2014 GR of \$187K. FFS Practice using PracticeWorks. #CA161

SAN FERNANDO VALLEY: NEW LISTING! General Dentistry, 3 Ops, established for 30 years. EagleSoft, Schick Digital X-Rays, 2013 GR of \$177K. #CA159

SAN FRANCISCO: General Dentistry. 1,744 sq. ft. w/4 equip. Ops, 1 add'l plumbed. Pano, Digital X-ray, Intra-oral Camera, Softdent software. 213 GR \$906K in 177 Dr. days, Adj. Net \$338K. #CA162

SANTA ANA: General/Pedo/Ortho practice on a main street with 11 Ops. Est. 20+ years. Pano & intra-oral camera. 2013 GR of \$424K with \$138K Adj. Net. 35% Denti-Cal. #CA136

SANTA CRUZ COUNTY: General Dentistry, 1,100 sq. ft., 3 Ops in prof. bldg. GR \$338K on 2 day/wk. 2,200 active pts. Schick Digital X-ray and Dentrix, 5 y/o Equipment. #CA550

SANTA MARIA: General Dentistry. 1,500 sq. ft. w/4 Ops. Easy Dental software, Dexis digital X-ray, Intra-oral Cameras. 2013 GR \$523K in 180 Dr. days, 5 days/Hyg. 16 years in current location. #CA166

SOUTH COUNTY SAN DIEGO - General Dentistry Practice & Bldg. 1200 sq. ft. on a main street. 5 years, 4 Ops. 2013 GR of \$310K on 150 days worked. #CA148

THOUSAND OAKS: FACILITY ONLY! Move-in ready 4 ops in 1,325 sq. ft. Modern design, Dentrix with 4 workstations, equipped business office, and sterilization area. Great start-up location or satellite office. #CA137

VICTORVILLE: General Dentistry, 3 equipped Ops plus 3 add'l plumbed in 2,150 sq. ft. est. 34 years, SoftDent. 2013 GR of \$313K and \$147K Adj. Net. #CA149

WALNUT CREEK: PRICE REDUCED! Prosthodontic Practice. 3 Ops and full lab. 2013 GR \$399K and \$143K Adj. Net. #CAM540

WEST LOS ANGELES: General Dentistry, 4 Equipped Ops, 1 add'l plumbed. Great LA location on the west side with GR of \$342K on just 2 doctor days/week. #CA117 —IN ESCROW

Include State Provisions in Privacy Policies, Procedures

CDA Practice Support

CDA recommends that members who are Health Insurance Portability and Accountability Act (HIPAA)-covered entities obtain the ADA Practical Guide to HIPAA Compliance for its comprehensive collection of templates for forms and written policies and procedures. When customizing the templates for use by your practice, make certain you include the following state requirements.

Time allowed to provide patient with access to records

California allows only 15 days to

provide a copy and five working days for inspection. HIPAA allows 30 days. You must comply with the shorter term.

Patient request to amend record

Patient requests to amend a record are uncommon in dental practices, but a HIPAA-covered entity must have policies and procedures to address these requests. Both HIPAA and state law provide patients the right to request amendments to their records. However, the laws differ in how a health care provider can respond to such a request. Ideally, a discussion with the patient regarding an amendment should occur prior to

initiation of the amendment process. Once a written request for amendment is submitted, the dentist must respond.

California law simply allows a patient to add a statement to the record. A patient amendment can be no longer than 250 words for each item that is believed to be incomplete or inaccurate. The health care provider must include a patient amendment in the record. Except for an emancipated minor, a minor patient does not have the right to amend his or her record.

Under HIPAA, a patient submits a request to the covered entity to amend the record. The health care provider can require that a written request be submitted and that the patient provide a reason for the amendment. The provider should respond within 60 days of receiving the request but may have another 30 days if the extension is requested in advance from the patient.

Refer to the ADA guide to learn more about HIPAA's requirements for responding to a patient request to amend a record.

Permissible uses and disclosures of patient information not requiring patient authorization

In general, HIPAA allows a covered entity to use or disclose patient information for treatment, payment and business operations. California law, however, defines the unauthorized access of patient health information as those uses not for the purpose of diagnosis or treatment, or as otherwise allowed by law. The allowed uses are included in California Civil Code Section 56.10. In summary, a patient's information may be provided with certain limitations and without patient authorization only to:

- Other health care providers for treatment of the patient.

September 19, 2014

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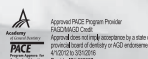
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- Third-party payers to collect payment for the patient's care.
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 - Appropriate accrediting and licensing entities in specific circumstances.
 - County coroners and public health departments for official purposes.
 - Appropriate entities for bona fide educational or research purposes.
 - Courts upon court order, law enforcement with search warrants or other government entities with orders pursuant to their respective legal authority.
 - Others as allowed or required by law.
- Therefore, the disclosure of patient information for business operations that are not included in Section 56.10, such as collections or practice sale, should not occur unless the practice has obtained patient authorization for the disclosure. A patient's signed acknowledgement of receipt of a notice of privacy practices that lists these business operations is not the same as patient authorization for disclosure.

Breach notification

California requires notification of individuals and others when there is a breach of unencrypted, computerized information that has a person's first name or first initial and last name in combination with any of the following:

- Social Security number.
- Driver's license number of California identification card number.
- Account number, credit/debit card number, in combination with any required security code, access code, or password that would allow access to the person's financial account.
- Medical information, defined as "any information regarding an individual's medical history, mental or physical condition or medical treatment or diagnosis by a health care professional."
- Health insurance information, defined as "an individual's health insurance policy number or subscriber identification number, any unique identifier used by a health insurer to identify the individual or any information in an individual's application and claims history, including any appeals records."
- A username or email address in combination with a password or security question and answer that would permit access to an online account.

The CDA Practice Support article "Data Breach Notification Requirements" can be included in a dental practice's policies and procedures. ■

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Mikhail Tsotsiashvili, DDS
Old Oakland Dental
Downtown Oakland

Practice continues "Legacy of Success" over 39 years with Three Different Owners

Doctor Michael Sosin retires in 1995

"Ray Irving sold my practice. He had just the person. We completed the sale in two weeks. It was smooth and problem free. My family and I continue as patients."
Michael Sosin, DDS

New Owner, Doctor Joel Boriskin in 1995

"Ray was keen to match me with the "right" practice. When this practice came on the market, he contacted me stating he had the one I was looking for. He was right! Even though I had practiced for 27 years, I have never enjoyed it as much as I do now."

Joel Boriskin, DDS

Doctor Joel Boriskin retires in 2013

"18 years later, Ray did it again! This time it was finding the right person to take over my practice. Ray gets that we are committed to our patients and our profession as he expertly guides his clients through a very tense and emotional time in our professional lives."

Joel Boriskin, DDS

New Owner, Doctor Erwin Yeh in 2013

"I contacted Ray in July 2010. I had a successful practice in Canada but family dictated a relocation. In Spring 2013, Ray found my practice. Ray was determined to match me with the 'right practice'. I could not be happier!"

Erwin Yeh, DDS

Doctor Michael Sosin's 2014 Comments

"Now Ray has helped Joel find the right dentist in Dr. Erwin Yeh. I can testify to his abilities as he is now my dentist. I started the practice in 1975. Thanks to Ray there have been two smooth and productive transitions and the practice continues 39 years later."
Michael Sosin, DDS

NORTHERN CALIFORNIA

- 6061 LODI** Beautiful 5-ops. Digital & paperless. 16+ years left on Lease.
- 6060 CONCORD** \$900,000/year. Strong profits.
- 6059 MODESTO** 2013 collected \$283,000 with Profits of \$146,600.
- 6058 MODESTO** Part-time, collected \$404,000 with Profits of \$211,000.
- 6055 VACAVILLE** 2013 collected \$568,000 on 3-day week with \$240,000 in Profits.
- 6051 FRESNO'S FIG GARDEN AREA** Collected \$430,000 in 2013 on 3.5 day week.
- 6047 STOCKTON** 2013 collected \$535,000. Attractive 3-Op office.
- 6043 EL SOBRANTE** 3-day practice collected \$184,000 in 2013. 3-ops. Building optional purchase.

SOUTHERN CALIFORNIA

- ANAHEIM** \$30K/mth part-time. 6 ops, New digital x-ray. FP \$225K.
- BAKERSFIELD AREA** Gross \$400K. FP for practice & building \$265,000.
- BAKERSFIELD** Grosses \$800,000. Nets \$400,000+. 5 Ops. Should do \$1 Million.
- BAKERSFIELD – NORTH** Seller grosses \$1,500,000 on 24 hour week.
- BAKERSFIELD – SOUTH** Practice & RE. 5-ops and apt. FP \$250,000.
- CORONA – NORCO AREA** Grosses \$90,000/mth. 8-ops. FP for practice & building \$1,850,000.
- DOWNEY** 5 ops. Full price \$250,000.
- HEMET** Grosses \$650K part-time. Will do \$1 Million. 10 op. FP \$585,000.
- HMO** 2 practices gross \$4.5 Million. \$35,000 cap checks/mth.
- HUNTINGTON PARK** HI IDENTITY 50,000 autos/day. Full Price \$195,000
- HUNTINGTON PARK** 98% Hispanic. Gross \$600K. Low overhead. 4-ops.

INDIO 4,600 sq.ft. building. Across from City Hall.

LAKE FOREST 7 ops located across street from major employer in OC.

LANCASTER Hi identity location only. 2-ops. Full Price \$55,000.

NEVADA Resort Area. Grosses \$600,000 on 3-days. Beautiful office.

PALM DESERT 5 ops, Grosses \$800,000. Bargain.

PASADENA AREA Grosses \$950,000 part time. Hi identity building also For Sale.

REDLANDS Bank Repo. 4-ops. Grosses \$30,000/mth. Full Price \$285,000.

REDLANDS 4 Ops. Should do \$300-to-\$400K first year with little marketing. FP \$285k.

RIVERSIDE Grosses \$860,000. Can do \$1.5 Million. Digital 10 ops in hi identity center near Walmart. Full Price \$800,000.

SAN DIMAS \$8,000+/mth HMO check. Hi Identity center. Refers a lot.

SAN FERNANDO VALLEY Part-time \$300,000+. Will do \$500,000. Building also available.

SAN FERNANDO VALLEY – BEST HISPANIC LOCATION 7 Ops. \$2 Million location. Practice \$1 Million, RE \$1.75 Million.

SOUTH ORANGE COUNTY BEACH CITY Gross \$950K in 2013. 5-ops.

SOUTH ORANGE COUNTY SHOPPING CENTER \$415,000 investment with \$2 Million gross upside.

SANTA ANA Hi identity center. 3 ops, low overhead, Grosses \$200,000.

TORRANCE Gross \$300,000+. Serves Palos Verdes. 3-ops.

TORRANCE - GARDENA Conservative DDS. Successor will do \$600,000 first year. Full Price \$185,000.

TUSTIN Hi identity center. 5 ops, 4 equipped. Future Million Dollar office

YUCCA VALLEY Location only. 800 sq.ft., 2-ops.



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BAY AREA

AC-243 SF Facility: Occupies entire 8th floor of beautiful Downtown SF Fin. Dist. Bldg 2500 sf w/ 7ops **\$150k**

BN-183 HAYWARD: *Kick it up a notch by increasing the current very relaxed work schedule!* 1,300 sf w/ 3 ops **\$150k**

BN-279 CONTRA COSTA COUNTY: Excellent Merger Opportunity! 2-story. 1,350 sf w/ 3 ops +1 add'l **\$60k**

BN-315 MARTINEZ: An absolutely amazing opportunity! ~ 1,550 sf w/ 4 ops + 1 add'l **\$450k**

CC-170 SOLANO COUNTY: Near Wine Country! 950 sf w/3 ops **\$225k**

CC-307 SOLANO COUNTY: 1/3 Interest in premier practice! One of the most valuable practices on the CA market in years! 6,785 sf w/ 20 ops **\$1.035m**

CN-189 RIO VISTA: In the heart of the beautiful California Delta! 3 ops **\$275k**

DC-274 SAN JOSE: Fantastic Shopping Center location near 85. 1,050 sf w/ 4 ops **\$275k**

DC-287 DUBLIN Facility Only: Space Share Facility with OS. 2ops + 1 add'l, 1100 sf **\$125k**

DC-308 ALAMEDA: Great Starter Practice close to 880! 1,100 sf w/ 4 ops **\$125k**

DG-116 SALINAS AREA: Large, loyal & stable patient base! 1,400 sf w/5 ops. State-of-the-art Equipment **\$175k**

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

DG-232 SANTA CRUZ: Large, well-established Medical/Dental Prof complex! 1,063 sf w/ 3 ops **REDUCED ! \$330k**

DN-310 SUNNYVALE: Established 24 yrs. Seller retiring! 965 sf w/2 ops + 1 add'l **\$75k**

DN-229 PLEASANTON Facility: Move in Ready! Attractive tree-lined street, mature landscaping and curb appeal. High foot traffic. 975 sf w/ 2 ops **\$150k**

NORTHERN CALIFORNIA

EG-198 SACRAMENTO: Tucked in well established "Pocket Area" in highly desirable corridor. 1,112 sf w/3 ops **Now Only \$55k**

EG-237 ROCKLIN: State-of-the-art, top-of-the-line equipment. 1,000 sf w/ 2 ops. Plumbed for 2 add'l **REDUCED! \$230k**

EG-283 ROSEVILLE: Visibility & location are unsurpassed! 1,008 sf w/ 4 ops **\$228k**

NORTHERN CALIFORNIA CONTINUED

EN-313 SACRAMENTO Facility Only: One of Sacramento's most vibrant and desirable areas! ~ 936 sf w/ 3 ops. **\$85k**

FG-309 ARCATA: Long established, income generating practice! 656 sf w/ 2 ops **\$215k**

FN-181 NORTH COAST: Well respected FFS GP. Stable patient base. 1,000 sf w/3 ops **\$150k (25% int. in bldg. avail.)**

FN-299 FERNDALE: Live and practice on the beautiful North Coast! 1,300 sf w/ 3 ops **\$225k (Real Estate: \$309k)**

GN-201 CHICO: Beautiful practice, major thoroughfare, stellar reputation! 1,400 sf w/ 4 ops & room for another **\$425k**

GN-244 OROVILLE: Must See! Gorgeous, spacious 2,500 sf office w/5 ops! Collections over \$450k in 2013. **Only \$315k**

GG-273 WILLIAMS: **Must Sell by End of Month!** Live & Practice in this wonderful close-knit community! 1,800 sf w/ 2 op + 2 add'l **\$75k**

GN-258 REDDING: Pristine and attractive! Conveniently located! 1,050 sf w/ 2 ops. **\$215k**

GN-324 YUBA CITY Facility: Newly updated office! ~ 1,704 sf w/ 4 ops, Motivated Seller! **\$75k**

HG-298 REDDING FOOTHILLS: Includes Cerec! 2,000 sf w/ 5 ops **Practice \$188k / Real Estate Also Available!**

HN-213 NORTH EAST CA: Close to the Oregon Border, this FFS practice is 2,200 sf w/ 3op +1 add'l **REDUCED \$115k**

HN-197 EAST LODI FOOTHILLS: Two practices for one great price! Call today for details! **\$595k**

HN-268 CALAVERAS COUNTY: "Main Street" charm & picturesque views of Central Sierra Foothills. 2,000 sf w/4 ops + 2 add'l **\$250k**

HN-280 NORTHEASTERN CA: "Only Practice in Town" 900 sf w/ 2 ops **\$110k**

HN-290 PLACERVILLE: Embrace the lifestyle and build your success story here! FFS. Office ~ 1,400 sf w/ 4 ops, **\$210k**

HN-317 SIERRA FOOTHILLS: "50% Buy-in" Opportunity in a desirable Foothill community. ~ 2,400 sf w/ 6 ops. **\$525k**

CENTRAL VALLEY

IC-277 STOCKTON & TRACY: 2 Quality FFS Practices **\$600k Call for Info!**

IG-067 STOCKTON: Fully computerized, paperless, digital. 5,000 sf w/10 ops **REDUCED! Now ONLY \$360k**

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Better Fit

Better Price!

SALES

CENTRAL VALLEY CONTINUED

IG-292 TRACY: PPO/HMO, Family Oriented, 1,300 sf w/ 4 ops Over \$200k in collections in 2013 **\$129k**

IN-193 MODESTO Facility: Recently remodeled! High foot traffic! 2,300 sf w/6 ops **\$49k (unequipped)**

IN-205 STOCKTON Facility: Desirable professional corridor. Newly remodeled. 1,565 sf w/ 4 ops **\$169k equipped or \$69k w/o equipment**

IG-247 ATWATER: Stunning practice! Cash flows well and profits better than most! 1,090 sf w/ 3 ops. State of the Art & Top of the Line! **REDUCED! NOW ONLY \$495k**

IN-297 MODESTO: The beautiful practice is set in a pristine, contemporarily designed medical/professional center. Office ~ 1,980 sf w/ 4 ops. PR: **\$475k / RE : \$425k**

JN-251 FRESNO: Dedicated to delivering the highest quality of care! 1,565 sf w/ 4 ops **\$140k**

JN-254 FRESNO: "Retro-vintage-designed". All this practice needs is you! 2,159 sf w/ 4 ops **\$140k**

JN-259 FRESNO Facility: **Newly Remodeled!** Low rent & overhead! Would cost much more to duplicate! 1,197 sf w/ 3 ops + 1 add'l. Seller Motivated! **\$45k**

JG-261 TULARE CO: Family-oriented. Desirable locale! Seller willing to stay for transition! 730 sf w/ 3 ops **\$325k**

JN-295 VISALIA: Practice & Real Estate 2,000 sf w/ 5 ops PR: **\$185k RE: \$300k**

SPECIALTY PRACTICES

DC-246 PLEASANTON Pediatric: Highly Motivated Seller! Pediatric Practice/Facility Only. 1700 sf w/ 4 ops. Plumbed for additional ops. **Practice \$325k or Facility only \$250k**

I-7861 CENTRAL VALLEY Ortho: 2,000 sf, open bay w/ 8 chairs. Fee-for-Service. **\$370k**

I-9461 CENTRAL VALLEY Ortho: 1,650 sf w/5 chairs/bays & plumbed for 2 add'l **\$180k**

EN-203 SACRAMENTO Oral Surgery: Highly efficient office. 3,000 sf w/ 4 ops **ONLY \$235k**

GN-284 CHICO Ortho: Warm, caring and well established! 900 sf w/ 2 ops + 1 add'l. **\$75k**

BC-230 CENTRAL CONTRA COSTA Perio: Loyal patients @ 2 locations! **\$650k**

EG-225 SACRAMENTO Ortho: Well-maintained, single-story Medical/Dental complex. 1,200 sf w/ 4 chairs **\$95k**

DG-264 SAN JOSE Ortho: \$300-400k in build-outs alone! 1800 sf w/ 5 chairs. **ONLY \$270k**

GN-304 NORTHERN SACRAMENTO Pedo: Well established, highly esteemed. ~ 1,800 sf w/ 4 ops **\$595k**

DN-293 LIVERMORE Perio: Specialty of Periodontics, Dental Implantology and Oral Medicine. ~2,200 sf w/ 5ops + 1 add'l. PR: **\$650k RE: TBD**

AC-325 SAN FRANCISCO Endo: Associate + Buy-In Opportunity in warm and caring environment. **Call for details!**



ASK THE BROKER

I am 13 years into my career and need to do a remodel on my practice. What factors should I consider to get a maximum return on my investment as I am starting to also plan for retirement?

I was recently published in a national dental journal addressing this issue. If you have eight or more years to practice, I believe it is always a good idea to invest in your practice. Of course, various equipment and leaseholds have different lifespans, but since we spend a huge portion of our lives at work, we deserve to work in an environment which we enjoy. A good environment with ergonomic equipment can help us enjoy working more years with greater satisfaction. Update your basic equipment and leaseholds on a routine basis. Substantial investments such as a Cerec machine or a 3D cone beam unit should only be purchased if it increases your return on investment. *It should be utilized enough to offset the expense. Don't assume that it will expand your practice. Be sure you have the patient base to support your investment. This is not like the famous line in the movie that states "if you build it, they will come!"

Generally speaking, if you only have five to ten years remaining in your practice, simple and inexpensive leasehold upgrades are definitely worth the investment. However, high-end equipment expenditures will generally not return the investment through an increased sales price of your practice. Practice value is typically based predominantly on your collections or net profit. Upgraded equipment and leasehold improvements may only increase the practice sales price nominally. With three or more remaining years, the one item I would encourage any dentist to invest in is Digital X-rays. Most recent graduates have never even seen an x-ray processor!

However, my crystal ball for the future tells me that once the baby-boomers start to retire, you might need an updated office with newer equipment in order for it to be competitive with the other practices on the market. Having said that, practices which are collecting less than \$400K to \$500K might be better merger opportunities as the average debt loan of a recent graduate is approaching \$400K. Those smaller practice owners may need to position themselves with shorter term leases to be able to move their patients into another office. Therefore, equipment and leasehold expenditures would definitely not be warranted. When you are five years out from your planned retirement, speak with your advisors to determine whether your best exit strategy is keeping your practice in its current location or leaving the opportunity open for a buyer to purchase your patient charts and merge them into another practice.

In summary, capital expenditure decisions are dependent on: 1) the time remaining before you retire, 2) the possible return on investment for new technology, and 3) the size of your practice and likely model for your specific transition requirements.

Timothy G. Giroux, DDS is currently the Owner & Broker at **Western Practice Sales** and a member of the nationally recognized dental organization, ADS Transitions.

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4013 STANISLAUS COUNTY GP

Well-managed GP with regularly increasing revenue. State-of-the-art 1,600 sq. ft. well-equipped office w/4 ops. Digital x-ray, Dexis, 4 x-ray machines, laser, piano and recent leasehold improvements. 2012 GR \$883K+, 2013 on schedule for \$968K+ as of Oct. Located near hospital in well-travelled area. Asking \$560K.

4033 PETALUMA GP

Owner retiring looking to transition 41 year-old practice to conscientious & dedicated dentist. Approx. 1,145 sq. ft. w/3 fully-equipped ops setup for right handed delivery; 2 bathrooms; business and private office combined; reception; lab and sterilization areas; and a separate storage area. ~1,000 active pts., avg. 7 new pts./month, 3.5 doctor days & 5 hygiene days per/wk. 2013 GR \$683K+. Asking \$477K.

4032 SOUTHERN PENINSULA GP

Well established GP located in highly desirable area. Beautiful 4 op office in lovely professional bldg. with excellent view on major cross street. 3 Dr. days & 4 hygiene days/week. 4 year average GR \$391K. Great upside potential. Asking \$300K.

4018 NAPA COUNTY GP

Seller retiring from a profitable, well-established Napa County practice w/large & loyal patient base. Located in 2,750 sq. ft. office w/6 modern fully-equipped & updated ops. including digital x-ray in each op. 2012 GR 1.7M+ & 2013 GR on schedule for 1.8M+ as of October. Asking \$1.4M.

4050 SANTA ROSA GP

Seller retiring & ready to transition well est. GP w/focus on restorative care. Spacious 2,100 sq. ft., elegant & modern office in seller owned building located on prominent corner of a well-traveled intersection close to shopping areas. 6 fully-equipped ops. Dedicated parking. Excellent leasehold improvements. Approximately 1,900 active pts. \$1.1M+ avg. GR w/66% overhead & 4 doctor days. Asking \$751K.

4051 MONTEREY COUNTY PROSTHO

Seller retiring, looking for quality first dentist for 100% private pay, well-est. Prosthodontic & Restorative practice. Avg. GR \$1.2M+. Contact us for details.

4040 FAIRFIELD GP & BUILDING

Well-established GP located in excellent, upscale area. 4 fully equipped ops in 1,615 sq. ft. Owner/dr. works 4 day work week with approx. 3 days of hygiene/week. **SOLD** GR \$335K. 2014 annualized GR \$433K with adj. net of \$183K. Approx. 700 active patients, all Fee-for-Service (no PPOs/HMOs). Retiring doctor willing to help Buyer for smooth transition. Practice listed at \$210K. Beautifully appointed building is also listed for sale, appraised value and listing price \$410K.

4030 MODESTO GP

Well-established & well run general practice available immediately. 2,500+ active pts. 4 year avg. GR approx. **SOLD** \$1,000,000. Seasoned staff, 10 hyg. days/wk, 4 Dr. days/wk. Beautiful 2,293 sq. ft. dental office in seller owned building with 6 fully-equipped ops. digital x-ray & regular dental equipment upgrades. Asking \$837K.

UPCOMING:

4038 SAN JOSE GP

O'Connor Hospital area. Modern, well appointed office in 1,800 sq ft. 5 ops, 4 fully equipped. 4 day doctor work week. Grossing over \$1M.

4049 PINOLE GP

Seller ready to transition 3 doctor day GP in dental office building located by busy shopping area close to charming downtown area.

4046 SAN JOAQUIN VALLEY ENDO & GP

Seller retiring from quality practice located in professional/medical building with referral sources, Excellent reputation. Avg. GR \$540K+



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Periscope offers synopses of current findings in dental research, technology and related fields

PERIODONTICS

Soft tissue wound healing comparison

Emecen-Huja P, Eubank TD, Shapiro V, Yildiz V, Tatakis DN, Leblebicioglu B. Peri-implant Versus Periodontal Wound Healing. *J Clin Periodontol* 2013; 40: 816-824.

Background: The implant-mucosal interfaces consist of sulcular and junctional epithelium and underlying connective tissue. Healing of peri-implant soft tissue is described as mucosal seal formation. The epithelial attachment forms one to two weeks after surgical placement of an implant and will mature as an epithelial barrier within six to eight weeks. In contrast to teeth, connective tissue fibers do not penetrate the implant and are organized parallel to the implant surface, generating a cuff. Due to lack of the periodontal ligament and its vascular anastomoses to periodontium and alveolar bone, suprapariosteal blood vessels around dental implants provide the sole blood supply of peri-implant soft tissue. Such anatomic differences have suggested that peri-implant soft tissue may have impaired defenses compared to gingiva around teeth. Detection of early peri-implant tissue changes through conventional clinical methods (e.g., probing) is limited; therefore in this study peri-implant crevicular fluid (PICF) and gingival crevicular fluid (GCF) were measured. PICF and GCF have a rich content of locally derived mediators that mimic wound fluid following surgery. Mediator molecules involved in the acute inflammatory response to surgical trauma are interleukin 1, 6 and 8, macrophage inflammatory protein (MIP) 1, matrix metalloproteinase 8 and 9, metalloproteinase inhibitor 1 (TIMP-1) and vascular endothelial growth factor (VEGF). Modulation of these tissue byproducts plays a major role in soft tissue integrity. Because pro-inflammatory cytokine levels are much higher in PICF than corresponding GCF levels, the peri-implant wound created by surgical trauma is expected to exhibit an acute phase response that controls tissue damage and infection and stimulates repair.

Purpose: The purpose of this study was to assess and compare soft tissue wound healing, including clinical and biological parameters, around dental implants (following implant placement surgery) and periodontally healthy teeth (following access flap surgery).

Material and methods: Fifty-seven patients were treatment planned for mandibular posterior sextant one-stage single implant placement. Immediately prior to surgery, plaque (PI) and gingival (GI) indices were recorded and GCF samples were collected from

the two teeth bounding the implant site (T+, two teeth combined as a single site) and from a nonoperated contralateral tooth (T-). At weeks one, two, three, six, eight and 12, PI, GI measurements and GCF/PICF collection were obtained from T+, implant (I) and T- sites.

Results: Forty patients (54.4 +/- 2 years old; 55 percent females) completed the study having received 26 and 14 implants replacing mandibular molars and premolars, respectively.

Clinical parameters: PI: At I (implant), PI decrease during early healing was nonsignificant ($P = 0.08$), while week 12, PI differed significantly from week one ($P = 0.0003$). Comparisons between groups revealed no significant differences.

GI: At surgical (T+ and I) sites, week one GI was increased significantly ($P = 0.01$) compared to T+ baseline GI. Surgical site GI declined significantly between weeks one and 12.

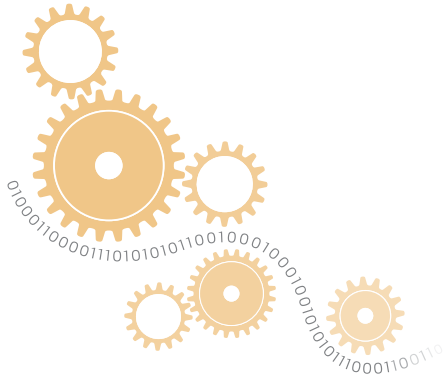
GCF/PICF: During early healing, GCF/PICF volume decreased significantly for surgical sites ($P < 0.001$). Volume differences between weeks one and 12 were also significant for surgical sites (I: $P = 0.0003$; T+: $P = 0.02$). T- GCF volume changes were nonsignificant throughout. During early healing, T- sites exhibited significantly less volume than either surgical site.

Biologic parameters: IL-6, IL-8, MIP-1b and TIMP-1 levels significantly increased at surgical sites at week one, significantly decreasing thereafter ($P < 0.016$). Week one IL-6, IL-8 and MIP-1b levels were ~threefold higher and TIMP-1 level was 63 percent higher at I, compared to T+ ($P = 0.001$).

Conclusions: There is a more robust response to surgical trauma in peri-implant wounds compared to periodontal tissues. Therefore, these results support the hypothesis that the wound healing response of peri-implant gingival tissues differs from the healing response around surgically manipulated teeth.

Clinical significance: This study underscores the inherent differences in peri-implant tissue response as compared to periodontal tissue healing response. Histologic and biologic characteristics around implant and teeth vary significantly, and clinical judgment should be used when managing peri-implant tissues as compared to periodontal tissues.

— Navid Sharifzadeh, DDS, and Kian Kar DDS, MS



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

The Chairside Instructor

(American Dental Association, Members \$99/Retail \$149)

As technology evolves, practitioners can take advantage of ways to more efficiently and effectively deliver patient education chairside. The ADA Chairside Instructor for iOS does just that by eliminating the paper drawings practitioners have customarily created and replaces them with an extremely simple, yet powerful tool that any member of the dental team can use to educate patients. The app opens with a table of contents of categories most commonly explained to patients during appointments. Selecting a main category opens a list of specific topics within that category. When a specific topic is chosen, a simple patient education page containing text and illustrations is displayed. Tapping an illustration enlarges it and allows the practitioner to draw or add text to the image. Any page or annotated image can be saved or emailed to the patient. Practitioners can also bookmark any page or image as a favorite. Searching for pages using keywords is included. With its powerful content and intuitive touch interface, The ADA Chairside Instructor brings patient education to a higher level.

—Hubert Chan, DDS

Aviate (Yahoo!, Free)

This Android launcher helps users organize their apps and their mobile home screens in a more productive manner. The goal is to allow the phone to be useful without having to leave the home screen. To set Aviate up, users select the apps they use the most and then select the types of apps they use most (productivity, social, entertainment, photography, news, etc.). The mobile device's home screen is then organized based on those selections. There is also a page on the home screen that features relevant information based on the time of day. Weather, news and "directions to work" appear in the morning, for example. Later in the day, it switches to directions home, gives the user traffic conditions, etc. Another interesting feature is that music apps are opened when headphones are plugged in to the phone. Android users who want to revert back to their original home screens will find it easy to do so, as one click of the home button allows them to decide on whether to keep Aviate or reset to their old settings.

—Blake Ellington, Tech Trends editor

Tile (Tile Inc., Preorder for \$19.95)

The product of a very successful crowdfunding campaign, Tile is a matchbook-sized Bluetooth device that allows users to track and find anything they attach it to — keys, computer, bike, etc. The approach the developers have taken with this device is unique: if the Tile device is in the immediate vicinity users can use Bluetooth-like sonar to ping and find the item, while if the item is further away it will anonymously utilize other Tile users' accounts to approximate the location of the item (via their connected mobile apps). In essence, they not only crowdsourced the development of the device, but also utilized crowdsourcing for its functionality, as well. The device is quick and easy to set up, requiring the installation of a free app on an iPad or iPhone. Once a simple user account is created, each Tile device is paired to the mobile app simply by pressing a button on the Tile to register it and then assigning it a custom name (such as "keys" or "bike.") Thereafter, a simple click of the Tile device within the app allows users to locate the device or see where it was last "seen" by the Tile app (on the user's device or any other users'.) Tile is currently only shipping out to early supporters, but pre-orders can be placed on the company's website, with prices ranging from \$19.95 for one Tile up to \$179.55 for 12. Current shipping estimates are listed as fall 2014. As other mobile platforms do not yet support Bluetooth 4.0, Tile does not currently support Android, Windows Phone or Blackberry.

—Blaine Wasylikiw, CDA director of online services

Toothflix (American Dental Association, Free)

Practitioners may need additional visual tools when educating patients on certain conditions or procedures. Toothflix for iOS takes the popular video education series and gives it a fresh update utilizing the latest technology. The app opens with a list of five main categories of the Toothflix series that consists of 26 videos that have been converted to an online digital format. Selecting a category displays a listing of videos to choose from. Tapping on a video plays the selection. At any point within the video, users can tap the bookmark on the playhead to save its video position, which is accessible through "My Clips" in the main menu or the bookmark clip icon in the video listings screen. Users can email the online link for any video to a patient by tapping on the envelope icon. As more dental offices utilize the latest in technological advances, Toothflix is a perfect fit for the future of patient education.

—Hubert Chan, DDS

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