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James J. Crall, DDS, ScD

April 2016

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A Light for Dark Places: Mental Wellness in Dental School

Christian Piers

I met Christian Piers after he accepted the 2015 American Association of Dental Editors and Journalists (AADEJ) award for the winter 2014 issue of the American Dental Student Association (ASDA) quarterly journal, Mouth. That issue focused on wellness and was dedicated to the memory of a student leader whose life was tragically cut short.

The following editorial and letter to the editor are poignant and uplifting. These students have taken a personal loss and turned it into a positive tribute dedicated to helping dental students recognize and cope with the stresses that come with the intense educational demands and personal struggles along the path to a degree in dentistry.

Depression and suicide are issues we all encounter in some manner during our lives. These ASDA leaders show us how important it is to appreciate our friends and look for ways to help those we see in trouble.

— Kerry K, Carney, DDS, CDE

The following article and letter are reprinted with permission from the American Student Dental Association and was originally published in the winter 2014 issue of Mouth. For more articles on dental student issues, visit ASDAnet.org.

This year ASDA lost someone dear to us.

It’s been hard. Suicide is complicated. It makes the sudden emptiness something we both want to talk about and don’t want to talk about. I want to talk about it for a moment.

Every day, I walk into my school through a hallway lined with class photos of smiling Colorado grads. I lock eyes with one or another of the monochrome faces, and it starts my day off with a moment of kinship and connection. Like my old friends on the wall are urging me on, letting me know I’m going to make it out of this.

I still remember one of my professors telling me his best friend killed himself in dental school. His friend’s photo didn’t make the wall. The square above his name reads, “In Loving Memory.”

My professor told us dental school wasn’t worth dying over. That seemed pretty obvious to me as a D1. The thing is, you can go into dental school having no idea you’re at risk. A few neurotransmitters. A game of genetic roulette that plays out before you’re born. And we’re not built to watch out for it.

We enter dental school convinced of our infallibility. We’ve been through the college gauntlet. We emerged at the top of our classes as the helpers, not the helped. But for many of us, dental school is more stressful than anything we’ve ever experienced. We’re perfectionists by definition, and we got into dental school because we demanded unreasonable things of ourselves, even when the actual demands were reasonable. In dental school, the demands have nothing to do with reason. Perfection is impossible.

Lots of studies have looked at dentist suicide rates since the 1960s. According to the International Dental Journal (Sancho and Ruiz, 2010), the main factors contributing to dentist suicide rates were a lack of professional treatment for the stress-related disorders associated with dentistry and a lack of preventive measures developed by universities and clinicians.

It’s no stretch to think those factors apply to dental students.

We can get so caught up in the idea of our invincibility that we lose sight of the fact that we sometimes need to ask for help.

That’s why we need to look out for each other.

Two days before ASDA lost its immediate past president, Jiwon Lee, in April [2014], I was with her in Chicago. I can’t remember most of the things we talked about. We were eating in sterile suit jackets, getting ready to sit behind our table tents in the boardroom. But I do remember saying I wanted to write about what drives dentists to suicide so we could talk about how to cut the risks in dental school. And her face never changed. We talked about it like it was just another story idea — maybe one I’d never write. Then we moved on.

I’ve been looking at the blank square on that class photo more often these past few months. Trying to make
peace with it and the other things it now means to me. I wish I could go back and meet that kid. Pick up on what I didn’t know how to look for, and connect him with some help.

I wish lots of things. And that’s what this issue is — it’s a chance to talk to someone before you can’t talk to them anymore. Resources you might need to help your best friend, or the quiet kid in the third row or yourself. You’ll read about spinal ergonomics and nutrition, and how to help a friend who’s struggling with addiction. You’ll read about how to deal with grief in dental school. We’re here to tell you that you’re not the only dental student who feels like this, and it’s OK if those feelings don’t go away when you squeeze a stress ball. We want to show you where to turn.

This issue is dedicated to Jiwon Lee.

— Christian Piers, Colorado ’16, Mouth editor-in-chief

In Memory of a Great Leader and Friend

Jiwon Lee was the 2012–13 speaker of the house and 2013–14 president of the American Student Dental Association. During her year as president, the association saw nearly 90 percent market share, the launch of the advocacy alert system Engage and productive collaboration with other dental organizations.

Jiwon was a great leader, an inspiring mentor and a steadfast friend.

In April of this year [2014], ASDA learned that Jiwon had gone missing. On May 4, ASDA was informed that Jiwon had passed away. She was 29 years old and a fourth-year dental student at Columbia when she died.

Jiwon’s suicide was a shock to all of ASDA, especially those who worked closest with her as national leaders. We wished we’d known that Jiwon was suffering. Everyone wishes they could have helped her. But Jiwon kept her struggles private from even her closest friends.

Jiwon had many gifts. She was a strong leader and could guide a boardroom to consensus. She was also a captivating speaker and an amateur comedian. Jiwon had a dry sense of humor and she really enjoyed making those around her laugh. Whether she was working on association policy or making you a birthday card, Jiwon put her whole heart into projects.

Now ASDA wants to remember Jiwon and honor her memory. She was a mentor to many students during her leadership term and I would not be where I am today without her guidance and support. It is with that spirit of generosity and compassion that ASDA has launched a health and wellness initiative. This issue of Mouth is one part of that initiative. More resources are featured on ASDAnet.org/wellness, including a page that will help you find free or affordable counseling services through your university.

You can expect to see wellness information on a regular basis in ASDA News and Mouth, in sessions at national meetings, and a wellness month in the fall of 2015.

As you read this issue, we invite you to reflect on your personal wellness. After all, Jiwon always wanted the best for ASDA’s members.

Thank you, Jiwon, for your mentorship, your leadership and your passion. Your legacy lives in these pages and in the hearts of those who knew you.

Sincerely,

Kristopher Mendoza, Los Angeles ’15, ASDA president

The Journal welcomes letters

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

The Journal’s November 2015 article, “Changing Paradigms for Acute Dental Pain: Prevention Is Better Than PRN,” presents nonsteroidal anti-inflammatory drugs (NSAIDs) as “safe and effective for most patients.” This statement is true regarding the effectiveness of these drugs, however it is misleading regarding the many patients for whom these drugs are not safe. All NSAIDs, the common over-the-counter variety as well as the newer COX-2 inhibitors, may cause heart attack and stroke. This risk was disclosed prominently in Europe with a 2011 article in The British Medical Journal. In the U.S., the Food and Drug Administration (FDA) recently warned that NSAIDs (all of them) increase the risk of heart attack and stroke. The FDA advises further, this risk is present in the absence of pre-existing cardiovascular disease. Furthermore, heart attack and stroke can occur early on with exposure to NSAIDs. Though the authors of the Journal article provide a warning that NSAIDs should be avoided in patients with a history of ulcers, irritable bowel disease, renal disease or cardiovascular disease, this caution is vague and easily overlooked — it is presented only in a table separate from the body of the published article. This warning to “avoid” fails to advise that these drugs can cause death and are thus strictly contraindicated in certain patients. Though NSAIDs are effective for the treatment and prevention of pain, as the authors so aptly demonstrate, these drugs are dangerous and more complex than many of the drugs commonly used in the practice of dentistry. Not only is fatal cardiovascular mishap associated with the use of NSAIDs, these drugs may also confound aspirin-anticoagulant therapy, antihypertensive treatment and anti-arrhythmia therapy. They are also well-known to cause gastrointestinal bleeding and kidney injury — especially when combined with common blood pressure medications. NSAIDs should not be given to asthmatic patients. More recently, NSAIDs have been shown to increase the probability of intracranial bleeding in patients taking antidepressants.

A recent study of Danish citizens revealed that cardiovascular risk associated with NSAIDs was prevalent at the outset of treatment. The Danes also noted in 2011 that patients who have heart disease are at increased risk for recurrent myocardial infarction with short-term use of NSAIDs. The risk of death from heart attack has been shown to be five times greater in those who had been taking NSAIDs when compared with those who were not. The risk of venous thromboembolism is twofold for those taking NSAIDs. The problem for dentists who administer NSAIDs is the high probability for undiagnosed heart disease, especially in the presence of an epidemic of obesity, diabetes, hypertension and dyslipidemia. The American Heart Association estimates that more than 83 million American adults have heart disease. Thus, a large portion of the American population is at risk for premature death caused by NSAIDs. This risk may be present from the very first dose.

The National Kidney Foundation warns that chronic use of NSAIDs may cause chronic kidney disease. The American Society of Nephrology estimates that up to 26 million Americans have chronic kidney disease — many do not know it. They warn that the use of NSAIDs, including the COX-2 inhibitors, can elevate blood pressure, make anti-hypertensive drugs less effective, cause fluid retention and worsen kidney function in patients with congestive heart disease and chronic kidney disease. For this population, they recommend safer alternatives in the short-term use of acetaminophen, tramadol or narcotic analgesics. Perhaps, we in the dental profession, who are often unable to know if our patients have heart or kidney disease, should treat our patients as if they do. Such a cautious approach would compel the choosing of safer drugs for pain management and would not require expert judgment in pharmacology. Perhaps we could use the author’s proposed preventive strategy of administering anti-inflammatory and analgesic compounds before dental treatment with drugs that pose less risk than NSAIDs; that is, we may use the author’s novel approach by prescribing those alternatives recommended by the American Society of Nephrology.

For dentists who read the Journal and are encouraged to treat patients with this paradigm, wherein NSAIDs are used as “premedication” for the prevention of dental pain, it is imperative that they be well-informed regarding the large number of patients for whom all NSAIDs, old and new, may cause morbidity or mortality. For those dentists who prefer a more cautious approach, I
suggest that patients be treated as if they could be obese, diabetic, hypertensive, asthmatic, affected by kidney disease or heart disease, taking medications such as antidepressants, aspirin, anti-coagulants, angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs) or hydrochlorothiazide. Treating patients in this cautious manner would be appropriate for a very large proportion of the population and would prevent the harm these drugs may cause. For if a patient is one among this large group, NSAIDs are not to be “avoided,” they are not to be given at all, regardless of how effective they may be in preventing pain.

**Dr. Dionne and Gordon Respond**

We thank Dr. Allan Jones for his careful reading of our article in the November Journal and for calling attention to the safety concerns regarding the use of NSAIDs for pain. We agree with Dr. Jones that NSAIDs are not safe for all patients and acknowledge their potential for producing “adverse gastrointestinal effects when given repeatedly” (Page 659) and their “cardiovascular effects that increase the incidence of myocardial infarction and stroke when given chronically” (Page 659). This is consistent with the recommendation in TABLE 1, “Factors for Individualizing Analgesics to a Patient,” to “avoid NSAIDs if history of ulcers, irritable bowel disease, renal disease or cardiovascular disease.” The thousands of studies that have been published with NSAIDs for acute pain and their FDA approval as both over-the-counter medications and as prescription medications in combination with opioids for the treatment of acute pain indicates that NSAIDs are not ‘dangerous and more complex than many of the drugs commonly used in the practice of dentistry.’ Their morbidity for acute pain is low compared to opioid combinations, while the risk of mortality is remarkably low in comparison to opioids. The use, misuse and diversion of opioid-containing analgesics have reached epidemic proportions in the U.S. and are associated with an estimated 13,000 to 16,000 deaths annually (citations 2, 3).

NSAIDs have been widely used in the U.S. for more than 40 years for both acute and chronic pain, but many of the well-recognized problems associated with their use relate to long-term administration for chronic disease such as osteoarthritis, low back pain and other musculoskeletal disorders. Their use for acute dental pain is recommended to be limited to a few days for patients who have usually been previously exposed to an NSAID through use of over-the-counter formulations and thus would not likely result in an idiosyncratic response. While acetaminophen is often administered to patients who are not appropriate for NSAID treatment, it shares the same potential for increased cardiovascular events when taken chronically, which is not surprising as it acts to inhibit cyclooxygenase-2 (COX-2) in humans (Lee YS, et al. Pain 2007, 129:279-86). Acetaminophen is also hepatotoxic when taken chronically and may result in fatal liver damage in an overdose or if combined with ethanol ingestion.

We concur with Dr. Jones that drugs used to treat acute pain— but not just NSAIDs — have the potential for serious adverse effects when given to the wrong patient, or prescribed to patients who have undiagnosed illness. That is the basis for recommending that analgesic drugs be individualized for each patient and for providing guidance in TABLE 1 to tailor the drug and dose based on medical history, family history, body weight and risk factors for drug abuse, in addition to the nature of the clinical procedure. The challenge of safely translating generalized recommendations, such as the PAIN prevention paradigm, into clinical practice is largely based on the knowledge of astute clinicians and their ability to adapt these recommendations to the individual patient. We applaud Dr. Jones for providing heightened awareness of the balance between enhanced therapeutic efficacy and safety when prescribing analgesic drugs for acute pain. However, the balance of evidence supports the judicious use of NSAIDs over the continued use of opioid combinations, which have a lower margin of safety, produce greater side effects in ambulatory patients and fail to target the inflammatory etiology of acute dental pain.

**References**

3. United States Food and Drug Administration. FDA strengthens warning that nonaspirin nonsteroidal anti-inflammatory drugs (NSAIDs) can cause heart attacks or strokes. Drug Safety and Availability 2015; FDA Drug Safety Communication.
Are Physicians Really That Unethical?

David W. Chambers, EdM, MBA, PhD

About 350 California physicians, of 105,000, have their licenses disciplined each year. A widely cited 2005 article in the *New England Journal of Medicine*, “Disciplinary Action by Medical Boards and Prior Behavior in Medical Schools,” seemed to place the blame on young practitioners and medical schools. The paper is frequently quoted among leaders in dentistry and dental education, even by those who have not read it.

The California version of this paper was published in 2004 by Maxine Papadakis and colleagues in *Academic Medicine*. Between 1990 and 2000, 70 graduates of a California medical school were disciplined. The academic records of these physicians were collected and coded, along with the records of 196 colleagues matched by year of graduation and specialty who had not been disciplined. The sources included admissions information, supervisor notes on rotations and dean’s letters of recommendation. Those with any mention of “concern” were placed in one category and those free of all concern were placed in a different category.

Logistic regression showed that physicians who had their licenses disciplined were twice as likely, statistically so, to have at least one note of concern in their medical school file. The researchers did not report the proportion of false positives (concern in school but not in practice) or the false negatives (concern in practice but not in school). Also not reported was the number of students dismissed from school for ethical reasons.

One interpretation given to this research has been that professional schools are falling down in their responsibility to identify, teach and screen out those now entering health care who may have unprofessional values. That depends heavily on what a license is disciplined for and what constitutes a concern over professionalism in medical school.

The most common reason of record for licensure trouble was negligence (38 percent). Various forms of unprofessional conduct, such as fraud, accounted for 27 percent. Many licensure issues (35 percent) were “failed lifestyle” matters, such as personal drug abuse, sexual misconduct or mental illness. Notes of concern about behavior in medical school also tended toward personal and social behavior: “student seems immature,” “needs reminders,” “disagrees publically with faculty,” “talks too much in class” and “nervous during admission interview.”

“OK,” I have heard some say, “this is not strong evidence, but at least it alerts us that we should be looking at the schools and the young folks coming into the profession as a moral concern.” Actually, if anything, the evidence suggests just the opposite. The average age of California physicians whose licenses were disciplined between 1990 and 2000 was 54. This is closer to retirement age than the beginning of independent practice.

As historian Mark Stoler notes, “History does not change, but our interpretation of it does depending on what has happened to us in the meantime.”

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The nub:
1. The term “ethical” is often used in a loose sense.
2. It takes time to grow into unprofessional practice habits.
3. Overgeneralizing based on thin evidence that supports one’s preconceptions is ethically problematic.

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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*.
Evidence That Early Human Ancestor Had Limited Ability to Eat Hard Food

A new study published in the journal Nature Communications describes biomechanical testing of a computer-based model of an Australopithecus sediba skull and shows that biting too hard would have dislocated the jaw of the A. sediba.

After research published in 2012 gained international attention by suggesting that this possible early human ancestor had lived on a diverse woodland diet, including hard foods mixed in with tree bark, fruit, leaves and other plant products, new research shows that A. sediba didn’t have the jaw and tooth structure necessary to exist on a steady diet of hard foods.

For their study, the research team used biomechanical methods similar to those used by engineers to test whether planes, cars, machine parts or other mechanical devices are strong enough to avoid breaking during use.

“Here we show that MH1, the type specimen of A. sediba, was not optimized to produce high molar bite force and appears to have been limited in its ability to consume foods that were mechanically challenging to eat,” the authors wrote.

“Most australopithecines had amazing adaptations in their jaws, teeth and faces that allowed them to process foods that were difficult to chew or crack open. Among other things, they were able to efficiently bite down on foods with very high forces,” said Professor David Strait, team leader and anthropologist from Washington University in St. Louis, in a news release.

The new study does not directly address whether A. sediba is indeed a close evolutionary relative of early Homo, but it does provide further evidence that dietary changes were shaping the evolutionary paths of early humans.

For more, see the study in the journal Nature Communications, 7, article number: 10596.

All three disinfectants were especially active against the fungus, but none of them were completely effective at clearing the entire biofilm. Calbenium was most effective at clearing biofilms and stopping new ones from forming, even at concentrations below what the manufacturers recommend. However, it did not kill the free-living amoebae.

“Unfortunately, our results showed that none of the three disinfectants commonly used are completely effective,” said the study’s lead author, Damien Costa, in a news release. “What is most worrying is that none of the disinfectants could kill the amoebae, which means they are still dangerous to patients and dentists even after water lines have been sterilized.”

For more, see the study in the journal Water Research, vol. 91, March 2016, pp. 38-44.
FDA Announces Action Plan to Fight Opioid Abuse

The FDA is deeply concerned about the growing epidemic of opioid abuse, dependence and overdose in the U.S. In response to this, the FDA recently announced an action plan to reassess its approach to opioid abuse. The plan will focus on policies aimed at reversing the epidemic, while still providing patients in pain access to effective relief.

“We are determined to help defeat this epidemic through a science-based and continuously evolving approach,” said Robert Califf, MD, the FDA’s deputy commissioner for medical products and tobacco, in a news release. “This plan contains real measures this agency can take to make a difference in the lives of so many people who are struggling under the weight of this terrible crisis.”

According to its website, the FDA says it will take the following actions:

- Re-examine the risk-benefit paradigm for opioids and ensure that the agency considers their wider public health effects.
- Convene an expert advisory committee before approving any new drug application for an opioid that does not have abuse-deterrent properties.
- Assemble and consult with the Pediatric Advisory Committee regarding a framework for pediatric opioid labeling before any new labeling is approved.
- Develop changes to immediate-release opioid labeling, including additional warnings and safety information that incorporate elements similar to the extended-release/long-acting (ER/LA) opioid analgesics labeling that is currently required.
- Update risk evaluation and mitigation strategy requirements for opioids after considering advisory committee recommendations and review of existing requirements.
- Expand access to, and encourage the development of, abuse-deterrent formulations of opioid products; improve access to naloxone and medication-assisted treatment options for patients with opioid use disorders.
- Support better pain management options, including alternative treatments.

The FDA reported that it is also strengthening the requirements for drug companies to generate postmarket data on the long-term impact of using ER/LA opioids. The agency expects this to result in the most comprehensive data ever collected in the field of pain medicine and treatments for opioid use disorder. The data will further the understanding of the known serious risks of opioid misuse, abuse, overdose and death.

“Things are getting worse, not better, with the epidemic of opioid misuse, abuse and dependence,” added Califf. “It’s time we all took a step back to look at what is working and what we need to change to impact this crisis.”

For more information, visit www.fda.gov/NewsEvents/Newsroom/FactSheets/ucm484714.htm.

Prevalence of Smoking Before, During Pregnancy

Evaluating maternal smoking prevalence and cessation before and during pregnancy, researchers of a new report recently found that smoking during pregnancy in most states averaged about 10 percent, ranging from 1.8 percent in California to 27.1 percent in West Virginia, according to the report published in the Centers for Disease Control and Prevention’s National Vital Statistics Reports.

“Maternal smoking during pregnancy is consistently reported as a predictor of adverse birth outcomes such as preterm birth and low birth weight as well as fetal and infant mortality,” the authors wrote. Yet, using 2014 birth certificate data, the researchers found that about one in 10 women who gave birth in 2014 smoked in the three months before pregnancy (10.9 percent), and about one-quarter of these women (24.2 percent) quit before pregnancy. The authors also reported that the smoking rate at any time during pregnancy was 8.4 percent, with 20.6 percent of women who smoked in the first or second trimesters quitting by the third trimester.

Groups with the highest prepregnancy smoking rates also had the highest smoking rates at any time during pregnancy, including women aged 20-24 (13 percent), unmarried women (14.7 percent) and non-Hispanic American Indian or Alaska Native women (18 percent), the authors wrote.

For more details, see the full report published in the Feb. 10, 2016, issue of the CDC’s National Vital Statistics Reports.
Was I supposed to learn about _______ in dental school?

There’s more to running a practice than providing exceptional clinical care. And CDA members are always just one quick call or click away from support. Through Ask an Expert, our in-house Practice Support experts provide timely and relevant answers to your questions about practice management, employment practices, dental benefits plans and regulatory compliance. See the answers to the questions your peers are asking, or ask your own tough questions, online today. CDA Practice Support. It’s where smart dentists get smarter.

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Race, Income and Survival for Esophageal Cancer

A new study from Duke Health researchers has discovered that low-income African-American patients with esophageal cancer survive fewer months after diagnosis than white patients, according to a news release.

The researchers analyzed data from the National Cancer Data Base to assess what effect the combination of race and low socioeconomic status has on cancer survival. The authors focused on esophageal cancer because it historically has had higher death rates among black patients and has a high overall mortality.

“In lower socioeconomic groups, outcomes for esophageal cancer vary by race, but not in higher socioeconomic groups,” said senior author Matthew G. Hartwig, MD, assistant professor of surgery at Duke. “This has implications for all sorts of cancers, not just esophageal cancer, and should be further examined to eliminate health care disparities.”

The authors studied the outcomes of 6,147 esophageal cancer patients who underwent surgery and found that, of those, 293 patients (5 percent) were black. Before adjusting for income, black patients had worse overall survival than white patients, living a median 33 months after diagnosis compared to 46 months.

Once income was factored in, there was no significant difference in overall survival between white and black patients in the two highest income brackets, according to the news release. Median survival in the higher income groups was 52 months for white patients and 61 months for black patients. However, significant difference in survival emerged between white and black patients in the two lowest income groups. Median survival for low-income African-Americans was 26 months versus 40 months for low-income whites.

“The finding that African-American patients have higher death rates after esophagectomy isn’t new,” said lead author Loretta Erhunmwunsee, MD, in the news release. “But our study adds to this finding, showing that black patients are most vulnerable when they are poor and that they may actually be protected when they have higher socioeconomic status. This finding suggests that targeting socioeconomic differences may help combat racial health disparities.”

The findings were presented during the January 26 press program at the annual meeting of the Society of Thoracic Surgeons in Phoenix. For more, visit corporate.dukemedicine.org.

Cancer Centers Call for More HPV Vaccinations

In a statement recently issued from the National Cancer Institute (NCI)-designated Cancer Centers, the organizations collectively recognized “low rates of HPV vaccination as a serious public health threat” and called for an increase in the number of HPV vaccinations for the prevention of cancer.

The Centers for Disease Control and Prevention reports that each year in the U.S., 27,000 men and women are diagnosed with an HPV-related cancer, which amounts to a new case every 20 minutes, according to the statement. Yet, even though many of these HPV-related cancers are preventable with a safe and effective vaccine, HPV vaccination rates across the U.S. remain low. In fact, a 2015 CDC report states that only 40 percent of girls and 21 percent of boys in the U.S. are receiving the recommended three doses of the HPV vaccine. This falls far short of the goal of 80 percent by the end of this decade, set forth by the U.S. Department of Health and Human Service’s Healthy People 2020 mission.

“The low vaccination rates are alarming given our current ability to safely and effectively save lives by preventing HPV infection and its associated cancers,” notes the statement. “… HPV vaccination is our best defense in stopping HPV infection in our youth and preventing HPV-related cancers in our communities. The HPV vaccine is cancer prevention.”

Among the calls to action urged in the statement, the organizations “encourage all health care providers to be advocates for cancer prevention by making strong recommendations for childhood HPV vaccination” and “ask providers to join forces to educate parents/guardians and colleagues about the importance and benefits of HPV vaccination.”

For more, see the full statement by visiting mskcc.org/sites/default/files/node/115951/document/nci_hpv_consensus_statement_final.pdf.
Highly Organized Structures Found in Microbial Communities

Bacteria typically live in mixed communities with a number of different kinds of bacteria present — and until recently, it has been largely unknown how these communities are organized, because the technology hasn’t existed to see how they are structured in space. But now, scientists have discovered distinct bacterial assemblages living in dental plaque, which they found using a novel imaging approach that “cuts through the overwhelming complexity of detail in microbial communities and allows common patterns to shine through.” The team discovered that the plaque on teeth contains micron-scaled “hedgehog” structures in which eight different kinds of bacteria are radially arranged around a ninth kind, filamentous Corynebacteria. With the ability to see these structures, researchers can gain valuable information on how the bacterial members function that can’t be gleaned from genomic analysis, which specifies what microbes are present in a community, but not how they are organized.

“Microbes behave very differently depending on where they are and who they are next to,” said Jessica Mark Welch, of the Marine Biological Laboratory, in a news release. “They will secrete entirely different sets of chemicals and metabolites depending on who their microbial neighbors are. So, if we want to accurately describe what these microbes are doing — really, what they are — we need to know where they are.”

The team proposes a model for how dental plaque develops, which is based on their imaging observations combined with plaque sequencing data from the Human Microbiome Project.

“This is a really exciting new way to look at microbial communities,” Mark Welch said of the spectral fluorescence imaging approach they developed at MBL. “The degree of organization we found in the hedgehog structure was amazing, as was the repeated finding of the same structure in different individuals. This finding that bacteria can develop such a degree of spatial organization may be generalizable to other microbiomes. We just have to go look.”

For more, see the research published in *Proceedings of the National Academy of Sciences*, vol. 113, no. 6, E791-E800.

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Stem Cells Capable of Repairing Skull, Face Bones

A team of scientists recently identified and isolated, for the first time, a stem cell population capable of skull formation and craniofacial bone repair in mice — an important step toward using stem cells for bone reconstruction of the face and head in the future.

According to the paper published in *Nature Communications*, the goal is to better understand and find stem-cell therapy for a condition known as craniosynostosis. One of the most common craniofacial deformities, craniosynostosis is a skull deformity in infants that often leads to developmental delays and life-threatening elevated pressure in the brain.

“Owing to various limitations, especially the lack of suture stem cell isolation, reconstruction of large craniofacial bone defects remains highly challenging,” the authors wrote, noting that their study provides “the first evidence for an Axin2-expressing stem cell population with long-term self-renewing, clonal expanding and differentiating abilities during calvarial development and homeostatic maintenance.”

This latest evidence shows that stem cells central to skull formation are contained within Axin2 cell populations, comprising about 1 percent, and that the lab tests used to uncover the skeletal stem cells might also be useful to find bone diseases caused by stem cell abnormalities.

Senior author Wei Hsu, PhD, believes his findings contribute to an emerging field involving tissue engineering that uses stem cells and other materials to invent superior ways to replace damaged craniofacial bones in humans due to congenital disease, trauma or cancer surgery.

“Further analysis of SuSCs provides outstanding opportunities to improve craniofacial repair and reconstruction, leading to future advancement in regenerative medicine,” the authors wrote.

For more, see the full report in the journal *Nature Communications*, 7, article number: 10526.
In “Quality Improvement Efforts in Pediatric Oral Health,” Man Wai Ng, DDS, MPH, describes efforts carried out through a series of quality improvement (QI) learning collaboratives to improve care and disease management for children with early childhood caries (ECC). In addition to providing a descriptive overview of the QI process and work conducted during three phases of the work with dozens of dental clinics and practices, the article includes summaries of disease management protocols and depictions of the “driver diagram” and measurement plan used in the ECC Collaborative.

“Dental Quality Measurement: A Practitioner Perspective” by Craig W. Amundson, DDS, of HealthPartners Dental Group (HPDG) reviews the rationale, motivation and history behind HPDG’s efforts to develop and implement quality measurement, accountability and QI in a large consumer-governed medical and dental health care delivery organization. HPDG’s clinical care model is based on five core principles: evidence-based care delivery, a focus on risk reduction and disease management, preservation of hard and soft tissue, application of a medical chronic disease
model to dentistry and maintenance and improvement of overall costs of care. Dr. Amundson highlights examples of investments that support care delivery based on these principles and provides a clinician’s personal perspective of how measurement and improvement efforts have contributed to a culture that responds to and embraces the growing imperatives for professionalism and accountability cited above.

In a third article, “Leading the Dental Quality Movement: A Dental Quality Alliance Perspective,” Diphee Ojha, BDS, PhD, and Krishna Aravamudhan, BDS, MS, describe the origins, history, process and achievements of the Dental Quality Alliance (DQA), a large multistakeholder organization whose mission is “to advance performance measurement as a means to improve oral health, patient care and safety through a consensus-building process.” The DQA has produced 22 measures, which are posted on the Agency for Healthcare Research and Quality’s National Quality Measures Clearinghouse. Seven of the DQA measures have been endorsed by the National Quality Forum, the gold standard for health care quality measurement, attesting to the rigor of the development and testing process employed by the DQA. Measures developed heretofore by the DQA have focused on care provided for children, the initial priority of the Centers for Medicare and Medicaid Services when it sought formation of a profession-led organization to develop measures for dental care. Current and future efforts of the DQA will include development of measures for care of adults and measures that are specified for use at the level of practices (in addition to measures designed for use in evaluating and improving programs and plans that administer benefits).

As has often been the case, performance measurement and quality improvement in dentistry has lagged behind efforts in medicine. However, the efforts described in this issue are examples of a growing trend that seeks to advance the practice and profession of dentistry and the programs that support use of dental services within the larger context of contemporary health care. ■

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Quality Improvement Efforts in Pediatric Oral Health

Man Wai Ng, DDS, MPH

ABSTRACT Quality improvement (QI) and measurement are increasingly used in health care to improve patient care and outcomes. Despite current barriers in oral health measurement, there are nascent QI and measurement efforts emerging. This paper describes the role that QI and measurement can play in improving oral health care delivery in clinical practice by presenting a QI initiative that aimed to test and implement a chronic disease management approach to address early childhood caries.

AUTHOR

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Conflict of Interest Disclosure: Man Wai Ng, DDS, MPH, has received grant funding from DentaQuest Institute and has served as principal investigator and clinical lead in the ECC Collaborative Phases 1, 2, 3 and the Virtual Practicum.
conforming to current standards of care and also allow them to be able to critically evaluate the care that their patients receive, to be able to measure what works, what does not and to implement changes to improve patient outcomes.

Despite the barriers to data measurement in oral health care, including the lack of a measurement culture, there are nascent quality improvement and measurement efforts emerging in dentistry. In 2010, the Dental Quality Alliance (DQA), comprised of a diverse group of stakeholders, was established by the American Dental Association to lead the development of evidence-based oral health and health care performance measures on multiple levels. One of the core objectives of the DQA is “to identify and develop evidence-based oral health care performance measures and measurement resources” through consensus-building processes. The Dental Quality Alliance’s initial measurement efforts have been focused on program-level and plan-level performance measures using administrative data obtained from claims submissions.

The purpose of this paper is to describe the role that data measurement and quality improvement can play in clinical dental practice by reporting on an oral health quality improvement initiative that aimed to facilitate the adoption of a chronic disease management approach to address early childhood caries (ECC).

Chronic Disease Management of Dental Caries

Dentistry’s Current Approach to Caries

The dental profession continues to primarily address dental caries as an acute surgical problem that requires restoration and repair. While restorative treatment repairs tooth structure, it does not address the underlying disease process. Young children with caries who are not cooperative are commonly sedated or treated under general anesthesia in an operating room (OR) setting. However, despite receiving costly treatment under general anesthesia, many children develop new and recurrent caries. If the responsible risk factors are not adequately addressed, new and recurrent caries will likely develop. A more effective approach may be one that relies on patient-specific prevention and focused management of the disease in addition to repairing defective tooth structure. Chronic disease management of dental caries is such an approach, which has been demonstrated in early studies to be effective in improving patient outcomes and may result in reduced costs.

What Is Chronic Disease Management?

Chronic disease management has been defined as a system of coordinated health care interventions in which patient self-management efforts are significant. Chronic disease management differs from a traditional approach where providers tell patients what changes to make. Instead, it relies on a close collaboration between an informed and engaged patient and/or parent and a proactive health care provider/team. Because dental caries is a chronic disease that is heavily influenced by social and behavioral factors, effective self-management of etiologic factors is required. An important role for dental practices and oral health care providers is to provide coaching and support to the family to make necessary behavioral changes, such as in oral hygiene, diet and fluoride use.

ECC Collaborative and Chronic Disease Management

Since 2008, DentaQuest Institute has supported multiple phases of the Early Childhood Caries (ECC) Collaborative. The ECC Collaborative is a learning collaborative modeled after the Institute for Healthcare Improvement’s Breakthrough Series. The ECC Collaborative has trained more than 40 dental and oral health care teams across the U.S. to use quality improvement strategies to test and implement a chronic disease management approach to addressing ECC. TABLES 1 and 2 show the most recent ECC chronic disease management clinical protocol. The protocol includes seven components:

- Caries risk assessment.
- Effective communication.
- Self-management goal setting.
- Caries charting.
- Fluorides and other remineralizing strategies.
- Restorative treatment as needed and desired by patient/family.
- Recare interval based on risk.

The ECC protocol along with its rationale and promising results from Phases 1 and 2 of the ECC Collaborative will be briefly summarized here as they have been described elsewhere.
### TABLE 1

#### Early Childhood Caries (ECC) Chronic Disease Management Clinical Protocol*

**Caries risk assessment**
- Performed in full or abbreviated format during each visit
- A child who has at least one tooth with demineralization or cavitation lesion is an ECC patient

**Effective communication**
- With permission, explain the caries process to parent and use structured communication strategies such as:
  - Fixing the cavities does not fix the problem
  - Without a change in diet and home care, new cavities and broken fillings will result
  - Change is hard and won’t happen overnight

**Self-management goal setting**
- Engage and coach parent to select one or two goals to work on until the next visit
- Goals may include more frequent toothbrushing, topical fluoride use and specific diet modification strategies

**Caries charting**
- Use a charting system, such as ICDAS or ADA caries charting system to:
  - Document caries by tooth, surface and activity
  - Monitor disease improvement or progression

**Fluorides and other remineralization strategies**
- Topical fluorides, including over-the-counter toothpaste, stannous fluoride, xylitol and/or calcium phosphate products can be offered

**Restorative treatment**
- Full range of treatment options can be presented based on each patient’s needs and parent’s desires, including
  - Conventional treatment (including use of pharmacologic management)
  - Interim therapeutic restorations for caries control

**Risk-based recare intervals**
- Patients are recommended to return in:
  - One to three months (if high risk)
  - Three to six months (if moderate risk)
  - Six to 12 months (if low risk)
- At the recare visit, perform:
  - Caries risk assessment
  - Self-management goal setting
  - Exam and charting
  - X-rays if indicated
  - Fluoride varnish

---

*Examples of disease indicators include demineralization, cavitated lesions, existing restorations, enamel defects, deep pits and fissures.

**Examples of risk factors include patient/maternal/family history of decay, plaque on teeth, frequent snacks of sugars/cooked starch/sugared beverages.

***Examples of protective factors include fluoride exposure (topical and/or systemic), xylitol.

†Brush with a smear of 1,000 ppm fluoride toothpaste.

‡Apply a smear of 1,000 ppm stannous fluoride to cavitated lesions.

### TABLE 2

#### Early Childhood Caries Risk-Based Chronic Disease Management Protocol

<table>
<thead>
<tr>
<th>Existing risk category</th>
<th>New clinical findings</th>
<th>Fluoride varnish interval</th>
<th>Self-management goals</th>
<th>Restorative treatment</th>
<th>DM return interval</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>No disease indicators of caries Completely remineralized (arrested) carious lesions</td>
<td>Six to 12 months</td>
<td>Twice daily brushing with fluoride toothpaste† Stannous fluoride‡ on cavitated lesions</td>
<td>Sealants ITR Conventional restorative</td>
<td>Six to 12 months</td>
<td>Xylitol gum, candies or wipes Calcium phosphate paste</td>
</tr>
<tr>
<td>Medium</td>
<td>No disease indicators,* but has risk factors** and/or inadequate protective factors*** Disease indicators present with some remineralization</td>
<td>Three to six months</td>
<td>Twice or more daily brushing with fluoride toothpaste Stannous fluoride on cavitated lesions Dietary changes</td>
<td>Sealants ITR Conventional restorative</td>
<td>Three to six months</td>
<td>Xylitol gum, candies or wipes Calcium phosphate paste</td>
</tr>
<tr>
<td>High</td>
<td>Active caries (disease indicators present) No remineralization occurring Heavy plaque</td>
<td>One to three months</td>
<td>Twice or more daily brushing with fluoride toothpaste Stannous fluoride on cavitated lesions Dietary changes</td>
<td>ITR Sealants Conventional restorative</td>
<td>One to three months</td>
<td>Xylitol gum or candies Calcium phosphate paste</td>
</tr>
</tbody>
</table>

---

*Examples of disease indicators include demineralization, cavitated lesions, existing restorations, enamel defects, deep pits and fissures.

**Examples of risk factors include patient/maternal/family history of decay, plaque on teeth, frequent snacks of sugars/cooked starch/sugared beverages.

***Examples of protective factors include fluoride exposure (topical and/or systemic), xylitol.

†Brush with a smear of 1,000 ppm fluoride toothpaste.

‡Apply a smear of 1,000 ppm stannous fluoride to cavitated lesions.
Caries Risk Assessment, Effective Communication and Self-Management Goal Setting

Assessing caries risk and supporting the control of risk factors are the cornerstones of the ECC clinical protocol. In practice, a full or abbreviated caries risk assessment is performed at every visit informally or preferably with a structured form. A care team member explains caries etiology to the patient or caregiver, provides coaching to alter the balance of risk and protective factors and provides support with self-management goal setting. Effective self-management support requires a collaborative approach with providers and patients working together to define problems, set priorities, establish goals and create treatment plans to solve problems. Recognizing that change is difficult to achieve, no more than one or two self-management goals are assigned to work on until the next visit. Self-management goals may include more frequent toothbrushing, using topical fluorides at home and diet modification. Visual flip charts and handouts are useful to help guide the conversation.

Caries Charting

A clinical examination and caries charting are important to monitor and document caries presence, progression and activity by tooth and surface. Using a charting system such as those developed by the American Dental Association,27 the International Caries Detection and Assessment (ICDAS)28,29 or an alternative system allows for tracking of important information for determining disease diagnosis, caries risk status and clinical treatment planning.30

Fluorides and Other Remineralization Strategies

The use of fluorides for caries prevention and management is both safe and effective in the office or at home. The frequency of professional fluoride treatments should be based on caries risk. High caries risk children should receive fluoride varnish every three to six months, while the recommended frequency for moderate-risk children is at least once every six months.30 Children with ECC, who have demineralized enamel or cavitated carious lesions may benefit from professional topical fluoride applications more frequently than every three months to assist in controlling the caries process.31

An adult should assist with toothbrushing beginning with the eruption of the first tooth using a smear of 1,000 ppm fluoride toothpaste, ideally twice each day.32 Xylitol and casein phosphate products are also available to assist in controlling the caries process at home.32

Restorative Treatment, Sealants and Interim Therapeutic Restorations

Tooth surfaces with deep pits and fissures of high caries risk children would benefit from bonded or glass ionomer sealants.33 If the destruction of tooth structure is minimal, caries arrest might be possible with demineralization strategies. If the decay has progressed into dentin or caries arrest has not been achieved, interim therapeutic restoration (ITR) may be performed to achieve caries control. The ITR procedure involves removing the decay using hand or rotary instruments with caution to avoid pulp exposure. After preparation, the tooth is restored with a fluoride-releasing glass ionomer restorative material. It is important for parents to understand that ITR is caries control rather than permanent restoration.33

When significant tooth structure has been destroyed by the caries process, restorative treatment is performed to restore function or improve esthetics. Long-term success of restorative treatment relies upon effective management of the disease, along with appropriate use of restorative techniques and materials.6 Conservative restorative treatment may be appropriate for a child whose caries risk has improved. However, a child whose caries risk has not improved and demonstrates progression of caries activity may benefit from a more aggressive approach to reduce new and recurrent decay in susceptible tooth surfaces, such as with use of full-coverage crowns.

When caries arrest is achieved, restorative treatment may be deferred, especially in an uncooperative child. However, close follow-up and preventive care based on caries risk are critical to safeguard from disease relapse.

Recare Intervals

Patients are recommended to return for recare frequency based on their caries risk (one to three months for high risk, three to six months for moderate risk and six to 12 months for low risk) and the desires of their parents. During each recare visit, a clinical examination

### TABLE 3

**ECC Collaborative Phase 1: Comparison of Rates of New Cavitation, Pain and Referral to the Operating Room (OR) Between ECC Patients and Historical Control Patients**

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Boston Children’s Hospital, Boston (N=403) %</th>
<th>Historical control (N=129) %</th>
<th>Improvement %</th>
<th>Saint Joseph Hospital, Providence, R.I. (N=234) %</th>
<th>Historical control (N=80) %</th>
<th>Improvement %</th>
</tr>
</thead>
<tbody>
<tr>
<td>New cavitation</td>
<td>26.1</td>
<td>75.2</td>
<td>▼65.3</td>
<td>41.0</td>
<td>71.3</td>
<td>▼57.5</td>
</tr>
<tr>
<td>Pain</td>
<td>13.4</td>
<td>21.7</td>
<td>▼38.2</td>
<td>7.3</td>
<td>31.3</td>
<td>▼23.3</td>
</tr>
<tr>
<td>Referral to OR</td>
<td>10.9</td>
<td>20.9</td>
<td>▼47.8</td>
<td>14.9</td>
<td>25.0</td>
<td>▼67.8</td>
</tr>
</tbody>
</table>
Evidence Supporting Chronic Disease Management of ECC

Phase 1 of the ECC Collaborative, which took place at two hospital-based dental care practices, found that after 30 months, children with ECC in the intervention group experienced lower rates of new cavitated carious lesions, pain and referrals for restorative treatment in the OR compared to baseline historical controls with ECC (TABLE 3).

A follow-up Phase 2 of the ECC Collaborative continued with five additional sites across the U.S. found that after 18 months, fewer disease management (DM) children experienced new cavitation, pain and referrals to the OR for restorative treatment compared to baseline historical controls (TABLE 4). The Phase 2 sites found that quality improvement strategies facilitated adoption of the chronic disease management approach and resulted in improved care to patients and better outcomes overall.

Barriers to Chronic Disease Management

Chronic disease management is not a new concept. Featherstone reintroduced the Caries Balance in 2003 and caries-risk assessment (CRA) tools have been available, such as through caries management by risk assessment (CAMBRA) and the American Academy of Pediatric Dentistry. However, while there has been a shift in dentistry toward a preventive approach to caries management, chronic disease management has not yet been systematically adopted into clinical practice. Some reasons for the continuing gap include the time required to translate science into clinical practice, insurance reimbursement favoring surgical management of dental caries, lack of provider training and lack of incentives for patients and providers to adopt new modes of preventive care and disease management. Although providers may be familiar with caries risk assessment and chronic disease management approaches, they may not know how to operationalize them into day-to-day clinical practice. In addition, most currently available dental information systems (electronic dental records) do not allow for measuring or tracking of patients’ oral health status.

Role of Quality Improvement in Clinical Practice

Quality improvement is based on a system of learning, incremental change and the incorporation of empirically supported best practices from evaluating performance and outcome measures. Quality improvement strategies are intended to support care delivery redesign and are opportunities to accelerate the pace of change into clinical practice.

Developed by Associates in Process Improvement, the Model for Improvement, has been used in the ECC Collaborative to guide changes made by teams to introduce, test, refine and sustain the ECC protocol in clinical practice. The Model for Improvement, composed of three key questions and the plan-do-study-act cycle, is a framework for testing changes in real work settings and offers guidance in how to learn from experience and how to determine an effective plan of action.

In the ECC Collaborative, participating practices performed many small tests of change (plan-do-study-act cycles), which have served as learning opportunities for how to conduct critical care delivery processes, e.g., how best to conduct CRA or implement self-management goal setting. Only those changes that resulted in measureable improvements in processes and/or outcomes were implemented by the sites and their providers into their clinical practice.

ECC Collaborative and Data Measurement

Driver Diagram

A driver diagram is a theory of change and represents a practice’s current hypothesis of cause and effect in the system—what changes will likely result in the desired effects. It depicts the relationship between the aim, the primary drivers that contribute directly to achieving the aim and the secondary drivers that are necessary to achieve the primary drivers. A driver diagram is most useful in planning a quality improvement initiative and also helps in defining which aspects of the system should be measured and monitored, to see if the changes/interventions are effective and if the underlying causal theories are correct.

### TABLE 4

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ECC (N=344) %</th>
<th>Historical control (N=316) %</th>
<th>Percentage of improvement %</th>
<th>Improvement range %</th>
</tr>
</thead>
<tbody>
<tr>
<td>New cavitation</td>
<td>33</td>
<td>46</td>
<td>▼28</td>
<td>▲14 - ▼71</td>
</tr>
<tr>
<td>Pain</td>
<td>8</td>
<td>11</td>
<td>▼27</td>
<td>▲80 - ▼100</td>
</tr>
<tr>
<td>Referral to OR</td>
<td>14</td>
<td>22</td>
<td>▼36</td>
<td>0 - ▼81</td>
</tr>
</tbody>
</table>
Measurement

How does one know if the changes made to a clinical practice or care delivery system are resulting in positive changes? One has to measure the results. FIGURE 2 shows the companion measurement plan to the ECC Collaborative driver diagram. The ECC Collaborative selected seven measurements and developed definitions for the measurements in terms of numerators and denominators. For example, measure 1, the percent of active patients with...
caries risk assessed in the measurement month, is determined by dividing the numerator, which is the number of active patients with caries risk assessed at the most recent recall or disease management visit, by the denominator, which is the number of active patients with visits in a measurement month. In the ECC protocol, a disease management visit is a visit that occurs between recall visits, during which CRA and self-management goals are revisited and fluoride varnish is applied. An active patient is defined as a patient who is between the age of 6 and 60 months who had a comprehensive exam within 18 months of the last day of the measurement month, unless otherwise excluded.

In Phase 3, the ECC Collaborative tested collecting of process and outcome data by having the dental providers enter these data directly into their electronic dental practice management systems during patient encounters. Because most electronic dental billing systems do not easily allow for entry of diagnostic codes, the teams instead used available dental procedure billing codes and made up “dummy” codes to represent patient diagnoses and outcomes. Testing was required at the local level because the practices had different workflows and used different electronic billing systems. At each patient encounter, providers entered one of the American Dental Association dental procedures and nomenclature (CDT) billing codes D0601 (low risk), D0602 (moderate risk) and

FIGURE 2. Early childhood caries collaborative measurement plan.
D0603 (high risk). Released for use in 2014, these caries risk CDT codes are procedure codes that are intended to be used to document patient caries risk diagnosis.

After engaging in self-management goal setting with a patient, providers entered a CDT code D3110 (nutritional counseling). If a patient was referred for sedation or OR treatment, CDT codes such as D9248 (non-IV conscious sedation) or D9220 (deep sedation/gen anesthesia CDT 2015 code) were used. Because there were no available codes to represent the presence of new cavitation and pain, the sites used made-up (dummy) codes such as NC001 and PA001 respectively.

FIGURE 3 shows an example of billing and caries charting codes used for a patient with ECC at the author's hospital-based dental clinic. On the visit date, April 11, 2014, billing codes D0603 (high caries risk) and D1310 (nutritional counseling/SMG) were recorded signifying that the patient received CRA and self-management goal setting. A bundle of codes consisting of 1MoDM (one month DM), D1330 (oral hygiene instructions) and D1206 (fluoride varnish) were entered as charges to represent a recare disease management visit completed one month after the patient’s prior preventive dental visit. An NC0001 (new cavitation) code was also entered. If pain related to untreated cavities was identified, a PA0001 code would be entered. If referral for sedation or operating room (OR) was needed, D9220 (deep sedation/gen anesthesia CDT 2015 code) would be entered.

FIGURE 3 also shows dental caries charting by tooth, surface and activity using condition codes that are modeled after the ICDAS29 and has similarities to the new ADA caries classification system.27 For example, D1 and D1.5 were charted to document demineralization and cavitation limited to the enamel respectively on the facial surfaces of the maxillary incisors.

Other codes, D2 for caries extended into dentin, D2C for very soft decay, D2B for slightly soft decay and D2A for decay that felt hard to the gentle feel of a spoon or explorer are also available for use to track patients’ caries findings from visit to visit and to help inform the patient’s caries risk, which can change from one visit to the next.

The Phase 3 sites installed an Access database, which facilitated submission of de-identified measurement data to the ECC Collaborative. For the sites that used Dentrix Enterprise as their electronic billing system, their data were automatically extracted each month and sent directly to DentaQuest Institute. The remaining sites collected their data into an Excel spreadsheet, which they uploaded into the Access database. DentaQuest Institute reviewed the data monthly to track the collective progress of the ECC Collaborative. A progress report, consisting of run chart data, along with feedback was sent monthly to each site.

FIGURE 4 shows examples of run charts of the process measures, “percent risk assessed,” “percent self-management goals” and “on-time return visits” for the ECC Collaborative in the aggregate. Among the sites, there was variability in performance. However, most sites quickly achieved and maintained high levels of reliability with caries risk assessment and self-management goal setting. More difficult to achieve in terms of reliable performance was on-time visits based on caries risk. In the ECC Collaborative, high-risk patients were recommended to return in one to three months, but a leeway was given in the...
order to be able to better understand their local trends, such as any variability with caries risk assessment and self-management goal setting completed (and as coded) by their practitioners. To be able to affect consistent behavior change in their providers and staff, the sites were further expected to meet regularly and to share their measurement data in a transparent manner. Open sharing of data to create friendly competition among providers and staff has been found to be helpful to improve overall practice performance.

**Challenges and Opportunities**

Critical to the success of all quality improvement efforts is having strong leadership to provide guidance, support and encouragement to the improvement work. The role of the senior leader is to prioritize and balance resources to ensure the sustainability of the changes made by the practice. Quality improvement efforts require dedicated time for the team members (providers and staff alike) to do the actual improvement work but also for key staff to meet regularly. It is important to convene regular staff meetings, but the meetings need not be lengthy. In fact, 15 to 20 minute huddles on a regular schedule, such as every week or every month, are valuable to allow staff members to report on measurement data and the results of completed plan-do-study-act cycles and to plan additional plan-do-study-act cycles. The ECC Collaborative has found quality improvement methods, such as testing changes using plan-do-study-act cycles on a small scale, measuring the results and implementing well-tested workflows and ideas into their unique practice settings to be useful to the sites.

Without doubt, there are impediments to using quality improvement strategies and data measurement in dentistry. Some of the more successful participating teams in the ECC Collaborative were hospital-
based and community-health-center-based dental practices that already had a quality improvement infrastructure in place and a culture to support improvement work. Yet other motivated practices also were able to achieve positive practice changes as well. Beyond facilitating the adoption of the chronic disease management approach, many other areas of current clinical dental practice could benefit from using quality improvement strategies to facilitate practice redesign and workflow enhancement, with the goal to improve patient outcomes and treatment costs. At the end of Phase 2 of the ECC Collaborative, team leaders were convened and asked, “What impact did the Collaborative have on you?” One team leader’s response was, “I no longer view children aged 0 to 5 the same way. I do not pick up the handpiece first.”

Conclusions

Measurement is necessary to promote and assess the impact of improvements in the quality of patient care delivery and outcomes. Although quality improvement and data measurement are not yet commonplace in dentistry, these strategies and tools have been found to be valuable to facilitate the adoption of chronic disease management approaches in an ECC Collaborative with more than 40 teams in the U.S. With the current focus on quality and value-based health care, it can be expected that quality improvement will become more familiar to dentistry as greater numbers of validated oral health quality measures become available for use by payers, third-party administrators, clinical practices and care providers.

ACKNOWLEDGMENT

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REFERENCES

40. THE AUTHOR, Man Wai Ng, DDS, MPH, can be reached at manwai.ng@childrens.harvard.edu.
Case Study

HealthPartners was founded in 1957 and is based in Minnesota. It is the nation’s largest consumer-governed medical and dental collaborative organization. The mission of the organization is to improve health and well-being in partnership with our members, patients and community. The HealthPartners organization includes the HealthPartners Medical Group and the HealthPartners Dental Group, along with associated medical and dental plans. The HealthPartners family includes most components of the broader health care system. It includes a multiple-hospital system, including a Level I trauma center, a pharmacy system, Health Promotion and the HealthPartners Institute for Education and Research. HealthPartners was instrumental in forming the Institute for Clinical Systems Improvement, ICSI, which is known for its mission to improve health care quality and value.

HealthPartners Dental Group, HPDG, consists of 24 HealthPartners dental clinics across the greater Twin Cities metropolitan area. It is an interdisciplinary, multispecialty group practice with some 75 dentists staffing the HPDG clinics. While HealthPartners dental operations date back to 1968, the activity to develop and implement quality measurement and accountability models in health care is well underway. In dentistry, the Dental Quality Alliance has taken a leadership role in developing measures for use in measuring and understanding health care results at the dental care program level. Those measures are developed utilizing dental plan, or program, administrative data as the source of information for measurement calculation. The Dental Quality Alliance intends to begin to focus on the development of measures that can be used to understand and enhance quality of care at the clinical level as well. The purpose of this article is to report on the development, implementation and use of dental quality measures within the HealthPartners Dental Group. The article provides information related to the organizational background of HealthPartners Dental Group, the clinical principles that drive care delivery and the health agenda for the HealthPartners Dental Group. It discusses the development and implementation of related quality measures and the use of quality measures in the management of operations.

Abstract

This article reviews the HealthPartners Dental Group’s experience with clinical quality measurement and provides information on the administrative infrastructure that supports measurement within the group. Some examples of the role measurement plays in operations and clinical practice are also reviewed.

Author

Craig W. Amundson, DDS, is a general dentist practicing with HealthPartners Dental Group. He currently represents the National Association of Dental Plans as a member of the Dental Quality Alliance. He chairs DQA’s measurement development and maintenance committee.

Conflict of Interest Disclosure: None reported.

Dental Quality Measurement – A Practitioner Perspective

Craig W. Amundson, DDS

Organizational Background

HealthPartners was founded in 1957 and is based in Minnesota. It is the nation’s largest consumer-governed medical and dental collaborative organization. The mission of the organization is to improve health and well-being in partnership with our members, patients and community. The HealthPartners organization includes the HealthPartners Medical Group and the HealthPartners Dental Group, along with associated medical and dental plans. The HealthPartners family includes most components of the broader health care system. It includes a multiple-hospital system, including a Level I trauma center, a pharmacy system, Health Promotion and the HealthPartners Institute for Education and Research. HealthPartners was instrumental in forming the Institute for Clinical Systems Improvement, ICSI, which is known for its mission to improve health care quality and value.

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significant development and growth of the dental group began in the mid-1970s. Initially, the dental group functioned entirely as a prepaid dental group practice. That is a significant factor. It fostered a business and professional environment that encouraged a focus not only on care delivery, but also on disease management, health improvement and reduction of total health care cost. The dental group continues to pursue a vision for the highest quality in the provision of health care, affordability and positive patient experience, which is consistent with the Institute for Health Improvement’s Triple Aim.

The HPDG has based its clinical practice on the following principles, which, with only minor changes, were developed and formally adopted by the group in 1993.

- The delivery of care using, and informed by, evidence-based care guidelines.
- A focus on disease management, disease risk assessment and risk reduction.
- The preservation of hard and soft tissues.
- The application of a medical model of care to dentistry.
- The maintenance and improvement of overall cost of care.

These practice principles provide the guidance for care delivery within the HPDG. They are the foundation for the group’s care and health improvement agenda. They are critical to the group’s planning processes and investment priorities. Finally, they provide constancy of purpose and drive the group’s clinical measurement activities.

HPDG uses measures related to dental clinic operations that are common to nearly all dental practices. These include measures of financial performance, measures of production, measures related to patient flow and facility utilization and measures related to access and patient experience. The purpose of this article is to discuss from a provider’s perspective the HPDG experience with quality measures focused on care delivery and health improvement that are less commonly used. Using the HPDG’s practice principles as a framework has some utility when discussing the use of quality measures within the group’s practice. There are professional concerns, care system design requirements, management and infrastructure investment implications associated with each of the principles. The application of appropriate measures is critical to understanding progress and planning for the future. A sample of measures follows and is aligned with each of the group’s practice principles.

The delivery of care based on evidence-based care guidelines. The commitment to provide care based on best evidence has been core to the HPDG’s professional agenda and measurement activity. From a provider perspective, the process for developing care guidelines is nearly as important as the end result. HPDG guidelines are crafted by teams of dentists and staff members. The guidelines are vetted by external experts in the appropriate area of clinical practice. The resulting guidelines are submitted to the National Guideline Clearing House (guideline.gov) where they are available. HPDG guidelines that are submitted to the National Guideline Clearing House address the most common oral health conditions and associated risk factors, including treatment of third molars, caries treatment and management, periodontal disease and oral cancer. A guideline related to treatment planning is currently undergoing periodic review. HPDG has additional guidelines that are developed in similar fashion, but are narrower in scope. These include topics such as appropriate orthodontic referral, antibiotic prescribing and

pain management, including opioid prescribing guidelines. These narrower guidelines are not submitted to the National Guideline Clearing House. The facts that the guidelines are a core part of the practice and that they are developed in an open and collaborative fashion are important factors in fostering understanding and acceptance of related quality measures across the practice.

A saying within the organization is that a guideline is not a guideline until it includes measurement. For the HPDG, the commitment and effort to develop and use evidence-based care guidelines was an important first step toward the acceptance and use of associated measurement. The guidelines are critical to the identification of key clinical and quality measures within the practice. The development and implementation process is foundational to a shared understanding of oral health goals, clinic processes and the importance of measurement within the group.

Over time, HPDG has invested in support structures that are critical to the management of operations and clinical performance improvement. Those investments in infrastructure also support the group’s care agenda and associated measurement. They include:

- An electronic clinical record that is highly customized to support HPDG’s care agenda.
- Risk factor and risk assessment documentation for caries, periodontal disease and oral cancer. It is part of the electronic dental record and structured to support the use of HPDG’s evidence-based care guidelines and associated measurement.
- Documentation of clinical advice and procedure recommendations related to risk reduction strategies for caries, periodontal disease and oral cancer, which is part of the electronic dental record.
- Automated personal care reports, which are produced for each patient summarizing risk and risk reduction recommendations related to caries, periodontal disease and oral cancer.
- An electronic documentation of health history, which includes a robust tobacco cessation module, and tracking of associated professional advice related to tobacco cessation.
- A diagnostic coding system that is used within the electronic record to document clinical findings at time of exam. Additionally, diagnostic codes are attached to any specific dental procedure at the time the care is provided.
- Appropriate database structures to facilitate the development and reporting of key measures at a provider, clinic, region or dental group level. This includes the ability to use both medical and dental clinical data to improve performance.
- A system for valuing each procedure based on relative time units.
- Most important, the group provides a safe, collegial and respectful work and practice environment that is conducive to the sharing of information and fosters open discussion related to measurement and performance.

Clinical practice with a focus on disease management, disease risk assessment and risk reduction. Focusing on disease and moving upstream in the disease process is an important part of the HPDG care agenda and associated guidelines. Risk assessment and risk reduction strategies are critical to that effort (FIGURE 1).

Based on the group’s care guidelines, there is an expectation that when seen for an initial or recall comprehensive

![FIGURE 2. Oral cancer interventions prescribed March 1, 2008, through Sept. 30, 2015.](image)
exam, a patient's risk level for disease should be assessed. Care and advice should be provided to attempt to reduce that risk. How might we apply measurement? Here is a sample.

An understanding of an individual's risk requires risk assessment. So the first measure relates to that. It is the percent of individuals who have undergone an initial or recall exam who also have risk factors and professional conclusions about risk levels documented in the electronic dental record.

To attempt to reduce risk requires the provision of services and advice intended to do that. So the second measure relates to interventions intended to reduce risk. It is the percent of individuals determined to be at moderate or high risk who also have one or more recommended interventions intended to assist them to reduce disease risk. These measures are reported separately for patients with elevated risk for caries, periodontal disease and oral cancer (FIGURE 2). The measurement results are also stratified by appropriate age group.

In order to affect changes in behavior needed to reduce risk, patients need to know and understand their risk factors and risk levels along with the advice and proposed interventions intended to reduce risk. A personal care report (FIGURE 3) is provided to each patient who undergoes a new patient or recall exam. It is intended to help educate individual patients about their risk levels and to provide advice to decrease risk. Therefore, the third related measure is the percent of all individuals with a comprehensive or recall exam with documentation in their records that a personal care report was printed.

The measures outlined above, along with other quality and performance measures, are reported back to each dentist as part of a quarterly dentist metrics report. They are aggregated and reported at the clinic level, clinic region level and systemwide. With this measure and others, data related to individual practitioners is generally kept confidential and aggregated data reported back to teams. Measures such as these are part of standing agendas for clinic staff meetings. They are regularly discussed in order to enhance shared understanding of the group's clinical goals and to continuously improve performance.

The practice will focus on the preservation of hard and soft tissue. As a group, the dentists associated with HPDG's endeavor to preserve tissue by reducing disease and risk of disease. Many of the measures covered elsewhere in this article relate to care and clinical processes that are intended to reduce the loss of tissue due to disease or surgical treatment of lesions associated with disease. The group is also committed to reducing unexplained variation in clinical practice that may result in unnecessary loss of tooth structure.

As with many practices, regular reviews based on chart audit are part of HPDG's quality assurance plan. In the case of dentists, charts are audited by colleagues.
on a quarterly basis with results shared directly with each dentist. The results are reviewed by the quality assurance committee. The group’s data systems are able to produce quarterly dentist metrics reports for each dentist on staff. These reports include a personal practice profile based on relative time unit measures of production. The data allow a dentist to compare his or her practice data with data aggregated at the clinic or system level.

The group will endeavor to apply a medical model of care to dentistry. An example of this principle is related to efforts to remineralize caries-related lesions that are limited to enamel, rather than a surgical approach to repair. This topic is included in the HPDG caries guideline. The electronic record includes specific diagnostic codes for caries-related lesions that may typically be considered for remineralization. Those would include lesions that have not extended beyond enamel and incipient lesions on root surface. The electronic record includes specific codes that are used to document clinical procedures and advice intended to remineralize appropriate caries-related lesions.

The measurement used is fairly straightforward. What percent of the individuals with caries-related lesions that may be amenable to remineralization received specific treatment or advice intended to alter the oral environment to promote remineralization. As with other measures, this measure is included in the quarterly dentist metric report for each dentist. The data are aggregated and reported at the clinic, region and system level.

Maintain or improve on overall cost of care. Reducing overall cost of care is an important component of the Institute for Health Improvement’s Triple Aim. Performance is a result of many areas of focus within the dental group. Effective implementation of the group’s care principles and efficient performance in daily operations contribute to positive cost performance. As a dental group, managing and reducing total cost to care for a population of patients is important. In clinic operations, improving efficiency and managing cost per unit of service is important as well.

HPDG has used a relative time unit value for dental procedures since its inception. In addition to aggregate cost to care for a population of patients, the clinical operating cost per relative time unit of production is one of the measures it uses. This measure does not have significant utility at the individual practitioner level, however, it is useful when reported at the clinic, region and system level. As with other measures, it is a part of the regular agenda for staff meetings at each clinic.

Measurement is not an end in itself. Measurement is a tool to support the pursuit of goals that are in the interest of our patients.

Provider Perspective

Measurement is not an end in itself. Measurement is a tool to support the pursuit of goals that are in the interest of our patients. It is reasonable for practitioners to feel some apprehension related to the development and implementation of quality measures. Will the sources of data be adequate for the task of quality measurement? Or, more correctly, when will the organized sources of data be adequate and available to support sound clinical quality measurement? Will society’s desire for transparency and accountability lead to quality reports that are based on measurement and data aggregation strategies that are marginally adequate or inadequate? Will the cost pressures on the health care system and the desire to “pay for performance” result in payment schemes that link payment to quality measures that are neither well tested nor fully relevant?

The resolution of concerns, which give rise to these kinds of questions, will require the focused attention, resources and time by our profession. While that is the case, the experience with quality measurement within the HPDG practice provides positive support for its inclusion as part of a practice’s clinical and operating strategies. When properly structured and focused, measurement becomes part of the fabric that provides direction and common purpose for the practice. In the case of HPDG, measurement results are part of the common language across the group. Measurement results are a part of nearly all standing agendas. Measurement results are factors considered in both clinical and administrative planning and decision making. In the experience of the HealthPartners Dental Group, measurement has been a critical component of a practice infrastructure that has effectively supported a focused clinical strategy over the life of the practice.
There are certain things in life that don’t reveal their true importance until they’re gone. A smile is one of them. Restore it and you return a world of possibility. That optimistic smile and the hope it holds is why CDA unites and passionately supports your profession. Because the world is a better place when people are smiling, and that’s thanks to you.
Leading the Dental Quality Movement: A Dental Quality Alliance Perspective

Diptee Ojha, BDS, PhD, and Krishna Aravamudhan, BDS, MS

ABSTRACT Changing regulatory priorities set forth by the Affordable Care Act and recent activities of the Centers for Medicare and Medicaid Services clearly prioritize the need to improve the quality of health care in both the public and private sectors. As the largest multistakeholder organization focused on oral health care quality measurement and improvement, the Dental Quality Alliance is leading the way in establishing standardized and valid quality measures applicable in both private and public sectors.

As national expenditures on health care continue to rise, the need to accurately assess quality and efficiency of care has become more urgent. Measurement forms the basis of evaluation and has become one of the foundations of the current efforts to improve health care quality. Establishing measures to identify and monitor innovative strategies to reduce incidence of oral disease, while simultaneously improving effectiveness and efficiency of care through a focus on prevention, is an important national priority. Although measuring the quality of health care and using those measurements to promote improvements in the delivery of broader health care are now commonplace, these concepts are still a rarity in the dental delivery system. The Dental Quality Alliance (DQA) aims to lead the dental profession into a paradigm of standardized measuring and reporting for the purpose of quality improvement of oral health care.

Quality Landscape in Dentistry

Over the years, there have been many legislative mandates that have highlighted the need for a quality focused health system. The Patient Protection and Affordable Care Act of 2010, commonly called the Affordable Care Act (ACA), seeks to increase access to high-quality, affordable health care for all Americans and is shifting the focus from volume-based reimbursement to payment models that emphasize quality and value. The mandate to publicly report quality scores for plans on public exchanges is scheduled to take effect this year. The Quality Rating System (QRS) proposed for the federally facilitated marketplaces requires qualified health plans that include an embedded pediatric benefit to report on the “annual dental visit” measure of dental service utilization.

The Medicaid market for dental care has grown significantly in many states as a result of the ACA and states’ efforts to expand eligibility. Even in states electing not to
expand Medicaid eligibility, economic changes have contributed to increases in the number of adults and children covered by Medicaid.6 Within an overall stagnant dental care sector, impacted by declining dental care use among middle- and high-income adults, Medicaid represents one of the few market segments with expanding demand for dental care.6 Although adult dental benefits are still not considered an “essential health benefit,” marketplaces and states have begun offering the option of purchasing unsubsidized dental coverage, which is a step toward improving access and reducing rates of adults without dental insurance coverage.7 Expanded coverage acts as a driver for additional development of measures of dental service utilization, value and the impact of dental services on the dental and general health of beneficiaries. Furthermore, greater emphasis on patient-centered, coordinated and integrated care and accountability form the basis for growing demands for measuring quality, performance and value pursuant to the ACA. Most accountable care organization (ACO) models that have emerged have largely focused on health care services for the Medicare population with little to no attention to dental services.8 However, over time, the share of commercial ACO contracts that include dental services has increased. Additionally, emerging models based on patient-centered dental homes could help bridge the gap between oral and general health care, improve coordination of care and help reduce overall health care costs.8

Private payers have long used administrative data analyses to assess various quality- or performance-related aspects of their benefit plans. Much of the knowledge gained from these analyses has been proprietary. Plans have created various types of provider “profiles” for internal use. It is anticipated that practice-level or clinician-level measurement will be used increasingly by payers to create “selective” or “high-value” networks. Commercial medical plans and a growing number of state-based medical collaboratives are beginning to publicly report quality scores for physicians.

The terms “quality measures” or “performance measurement” have been largely elusive in dentistry. The Institute of Medicine (IOM), in two reports, has identified a lack of quality measures as a barrier to improving oral health and reducing oral health disparities.9,10 The IOM defines quality of care as “the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”11 An increasing variety of stakeholders is demanding accurate measures of quality to determine whether high-quality care is being provided consistently across the health care delivery system. A report from the Kellogg Foundation and the DentaQuest Institute outlines an approach to expand the oral health quality improvement effort through data collection, accountability and new ways of delivering oral health care.12 In recent years, a growing number of quality measures and reporting initiatives have resulted in a proliferation of measures that are often duplicative and unduly burdensome on health care providers and increase the potential for confusion among the public.4

The role of a dental and oral health measure developer has long been occupied by entities that are not traditionally from the dental industry. These activities within dentistry, until recently, have been limited to the federal agencies such as the Centers for Medicare and Medicaid Services (CMS), Health Resources and Services Administration (HRSA), the Agency for Healthcare Research and Quality (AHRQ), commercial private purchasers/payers, data analytics companies supporting these commercial health plans.

### TABLE 1

**Dental Quality Alliance Member Organizations**

<table>
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<tr>
<th>Organizational Members</th>
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<tr>
<td>Academy of General Dentistry</td>
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<tr>
<td>American Academy of Oral &amp; Maxillofacial Pathology</td>
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<tr>
<td>American Academy of Oral &amp; Maxillofacial Radiology</td>
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<td>American Academy of Pediatric Dentistry</td>
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<td>American Academy of Periodontology</td>
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<td>American Association of Endodontists</td>
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<td>American Dental Education Association</td>
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<td>American Dental Hygienists’ Association</td>
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<td>American Medical Association</td>
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<td>America’s Health Insurance Plans Council on Access, Prevention and Interprofessional Relations (ADA)</td>
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<td>Council on Dental Benefit Programs (ADA)</td>
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<td>Council on Dental Practice (ADA)</td>
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<td>Council on Government Affairs (ADA)</td>
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<td>Delta Dental Plans Association</td>
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<td>DentaQuest</td>
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<td>Managed Care of North America Dental Medicaid-CHIP State Dental Association</td>
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<td>National Association of Dental Plans</td>
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<tr>
<td>National Network for Oral Health Access</td>
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<td>The Joint Commission</td>
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<td>American Association for Dental Research</td>
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<th>Associate Organizational Members</th>
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<tr>
<td>Adirondack Oral &amp; Maxillofacial Surgery</td>
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**Public Member**

**Public Member**

**Department of Health and Human Services Technical Advisor Liaisons**

Agency for Healthcare Research and Quality
Centers for Disease Control and Prevention
Centers for Medicare and Medicaid Services
Health Resources and Services Administration
Dental Quality Alliance

The DQA is comprised of major dental professional societies, payers, educators and a member from the general public. Several federal agencies under the Department of Health and Human Services (HHS) serve as technical advisors to the DQA. These entities have all come together as an alliance to “advance performance measurement as a means to improve oral health, patient care and safety through a consensus-building process.” In doing so, the DQA has been committed to identifying and developing evidence-based measures, advancing the scientific basis of clinical performance measurement and improvement, and fostering and supporting professional accountability, transparency and value in oral health care. The current DQA members are listed in Table 1.

DQA Structure

The strong participation by all stakeholders in dentistry along with the volunteerism that generates the work products for the DQA is of paramount importance to its success (Figure 1).

The DQA’s executive committee oversees the management of the DQA’s strategic, operational and organizational business. To carry out its mission and objectives, the DQA has three core functions:

- **Measure development and maintenance.** Develop evidence-based oral health care performance measures and measurement resources, and advance the effectiveness and scientific basis of clinical performance measurement and improvement. This committee oversees the work of the DQA e-Measures Committee that develops electronic clinical quality measures.

- **Education and communication.** Educate and communicate with the dental profession and other interested parties regarding performance measurement. This committee also produces educational information regarding the DQA organization and activities.

- **Implementation and evaluation.** Identify and analyze current use of DQA measures and provide guidance for quality improvement.

The DQA draws its strength from its multistakeholder membership involvement and its open and transparent operations. As the only comprehensive multistakeholder collaborative for the development of dental quality measures, the DQA is well-positioned to collaborate, coordinate and lead efforts in measure development through its members’ experience, expertise and support.

Measure Development

An environmental scan conducted by the DQA in 2012 demonstrated that there was a clear need for a balanced approach that evaluates all aspects of care to better understand disparities and adequately plan for improved quality. Although a wide variety of stakeholders has independently pursued quality measure development in dentistry, evidence depicts that there is a significant lack of a standardized set of measures between public and private sectors and across community/state/national levels. Further, there was a need for a balanced approach that evaluates all aspects of care to better understand disparities and adequately plan for improved quality.

In 2008, CMS proposed to the American Dental Association (ADA) establishing a Dental Quality Alliance (DQA), a multistakeholder organization, to lead the efforts in quality measure development.
Measure Development Process
The DQA undertakes a comprehensive approach to measure development that is collaborative, transparent and meaningful. The process entails scanning the environment to identify existing oral health performance and quality measure concepts. The scan is released to the dental community for input. Based on the feedback received, the DQA proposes specific measure concepts and releases to the dental community for further commenting. This transparent approach results in proposed measures and their draft specifications. Following a comprehensive request for proposal (RFP) process, the DQA selects a capable research team to conduct validation testing. Throughout the testing process, the DQA engages the stakeholders continuously to solicit feedback and input. This process is discussed in detail in the DQA Measure Development Manual (FIGURE 2).

Starter Set Pediatric Dental Quality Measures
To implement standardized performance measurement that fosters quality improvement and improved health outcomes, clearly specified, feasible, reliable and valid measures are required. DQA measures have been developed through extensive testing for validity, reliability, feasibility and usability and are clearly specified, with the intent of evaluating dental health services to allow dental plan and programs to monitor these services.

In order to advance its mission of advancing performance measures and quality improvement in oral health, the DQA developed and approved 14 pediatric measures (TABLE 2). Targeted at the goal of addressing “dental caries in children: prevention and disease management,” these measures fall under the Agency for Health Research and Quality’s domains of use of services, process, access and cost of care and addresses utilization, cost and quality of dental services for children enrolled in public (Medicaid, Children’s Health Insurance Program (CHIP)) and private (commercial) insurance programs. Of the 14 measures, 12 of them have been developed for implementation with administrative enrollment and claims data for plan and program level reporting. These measures have been developed in partnership with the University of Florida. Part of the testing of these measures has been provided by the American Dental Association Foundation (ADAF). Two measures from the starter set that were adapted for implementation with electronic health records (EHRs) were developed under contract with the Office of the National Coordinator for Health Information Technology (ONC) as electronic clinical quality measures (eCQMs) for the 2017 edition of the Centers for Medicare and Medicaid Services’ Medicaid EHR Incentive Program (Meaningful Use) and are designed for implementation at the clinician level. The DQA provides comprehensive technical assistance for measure implementation. A user guide has been developed by the DQA to provide guidance on the appropriate use of the DQA measures.

Additionally, the DQA has established a comprehensive measure maintenance protocol. In an effort to maintain the properties and the integrity of the measures, the DQA measures and the user guide are reviewed on an annual basis.

Measure Endorsement, Implementation and Educational Activities
Following CMS guidance, the DQA began submitting its measures to the National Quality Forum (NQF), an independent nonprofit organization that evaluates health care quality measures. An NQF endorsement is the gold standard for health care quality. NQF-endorsed measures are evidence based, valid and in tandem with the delivery of care and payment reform. The DQA currently has seven of its quality measures endorsed by the NQF. An NQF endorsement is an important criterion for quality measure selection among many public and private payers.

As measures are developed and endorsed, the DQA is placing significant focus on their implementation. Of note is the announcement from Covered California, a state-based marketplace operating in California, to adopt DQA measures for its qualified dental plan
<table>
<thead>
<tr>
<th>Measure name</th>
<th>Description</th>
<th>NQF #</th>
<th>Data source</th>
<th>Measure domains</th>
<th>Level(s) of measurement</th>
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<tbody>
<tr>
<td><strong>Evaluating Utilization</strong></td>
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<tr>
<td>Utilization of services</td>
<td>Percentage of all enrolled children under age 21 who received at least one dental service within the reporting year.</td>
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<td>Administrative enrollment and claims</td>
<td>Access/ process</td>
<td>Program, plan</td>
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<tr>
<td>Preventive services for children at elevated caries risk</td>
<td>Percentage of all enrolled children who are at “elevated” risk (i.e., “moderate” or “high”) who received a topical fluoride application and/or sealants within the reporting year.</td>
<td>N/A</td>
<td>Administrative enrollment and claims</td>
<td>Related health care delivery: use of services</td>
<td>Program, plan</td>
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<tr>
<td>Treatment services</td>
<td>Percentage of all enrolled children who received a treatment service within the reporting year.</td>
<td>N/A</td>
<td>Administrative enrollment and claims</td>
<td>Related health care delivery: use of services</td>
<td>Program, plan</td>
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<td><strong>Evaluating Quality of Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral evaluation</td>
<td>Percentage of enrolled children under age 21 who received a comprehensive or periodic oral evaluation within the reporting year.</td>
<td>2517</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Topical fluoride for children at elevated caries risk</td>
<td>Percentage of enrolled 1- to 21-year-olds who are at “elevated” risk (i.e., “moderate” or “high”) who received at least two topical fluoride applications within the reporting year.</td>
<td>2528</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Sealants for 6- to 9-year-olds at elevated caries risk</td>
<td>Percentage of enrolled children in the 6-to-9-years age category at “elevated” risk (i.e., “moderate” or “high”) who received a sealant on a permanent first molar tooth within the reporting year.</td>
<td>2508</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Sealants for 6- to 9-year-olds at elevated caries risk</td>
<td>Percentage of enrolled children in the 6-to-9-years age category at “elevated” risk (i.e., “moderate” or “high”) who received a sealant on a permanent first molar tooth within the reporting year.</td>
<td>N/A</td>
<td>Electronic health records</td>
<td>Process</td>
<td>Practice</td>
</tr>
<tr>
<td>Sealants for 10- to 14-year-olds at elevated caries risk</td>
<td>Percentage of enrolled children in the 10-to-14-years age category at “elevated” risk (i.e., “moderate” or “high”) who received a sealant on a permanent second molar tooth within the reporting year.</td>
<td>2509</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Care continuity</td>
<td>Percentage of all children enrolled in two consecutive years who received a comprehensive or periodic oral evaluation in both years.</td>
<td>N/A</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Care continuity</td>
<td>Percentage of all children enrolled in two consecutive years who received a comprehensive or periodic oral evaluation in both years.</td>
<td>N/A</td>
<td>Electronic health records</td>
<td>Process</td>
<td>Practice</td>
</tr>
<tr>
<td>Usual source of services</td>
<td>Percentage of all children enrolled in two consecutive years who visited the same practice or clinical entity in both years.</td>
<td>N/A</td>
<td>Administrative enrollment and claims</td>
<td>Access/ process</td>
<td>Program, plan</td>
</tr>
<tr>
<td>Ambulatory care sensitive emergency department visits for dental caries in children</td>
<td>Number of emergency department visits for caries-related reasons per 100,000 member months for all enrolled children.</td>
<td>2689</td>
<td>Administrative enrollment and claims</td>
<td>Outcome</td>
<td>Program</td>
</tr>
<tr>
<td>Follow-up after emergency department visit by children for dental caries</td>
<td>Percentage of ambulatory care sensitive emergency department (ED) visits for dental caries among 0- to 21-year-olds in the reporting period for which the member visited a dentist within (a) seven days and (b) 30 days after the ED visit.</td>
<td>2695</td>
<td>Administrative enrollment and claims</td>
<td>Process</td>
<td>Program</td>
</tr>
<tr>
<td><strong>Evaluating Efficiency and Cost</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per-member per-month cost of clinical services</td>
<td>Total amount that is paid on direct provision of care (reimbursed for clinical services) per member per month for all enrolled children during the reporting year.</td>
<td>N/A</td>
<td>Administrative enrollment and claims</td>
<td>Related health care delivery: efficiency and cost</td>
<td>Program, plan</td>
</tr>
</tbody>
</table>
contracts for plan year 2016. The Centers for Medicare and Medicaid Services (CMS) has incorporated the DQA dental sealant for 6- to 9-year-olds measure into the core set of children’s health care quality measures for CHIP with reporting starting in 2015.16 HRSA has proposed changes to the calendar year (CY) 2015 Uniform Data System (UDS) to include the DQA dental sealant eMeasure to be reported by Health Center Program grantees that started in early 2016.17 As more entities implement these measures across different systems, a standardized, balanced approach toward measurement is achievable.

In an effort to facilitate implementation, DQA provides technical assistance to users of DQA measures. The DQA conducts webinars and workshops, develops technical briefs and reports to educate the dental community at large to facilitate the appropriate implementation of these measures.

The DQA is also working with staff from Covered California to develop educational and technical resources to facilitate the DQA measures implementation to evaluate dental plans. As the measure development and implementation activities progress, the DQA is also very sensitive to the fact that all sections of the profession that impact the oral health of our population must be educated on the need for quality and performance measurement. The DQA maintains extensive educational resources on its webpage at ada.org/dqa. Most important, this page hosts the Guidebook on Quality Measurement in Dentistry, which offers insight into what “quality” means for dentistry.1 There are also several tutorials posted on this page to help us better understand quality and performance measures.18 In addition, the DQA holds a conference on quality measurement every two years with the intent of training thought leaders in dentistry to spread the knowledge about quality measurement. The DQA is continuously developing educational resources for various target audiences to promote the value of standardized measurement.

Conclusions
A balanced measurement approach that evaluates multiple aspects of care is essential to promoting improved outcomes, understanding disparities and planning for improved performance. The need to measure quality is rooted in the basic responsibility to assure that the public receives optimal benefits from available knowledge and effective care. The DQA has been at the forefront of the quality movement in dentistry and effectively leading the charge to improve oral health outcomes.

REFERENCES

THE CORRESPONDING AUTHOR, Dipette Ojha, BDS, PhD, can be reached at ojha@ada.org.
Growth Trends in Dental Service Organizations

CDA Communications Staff

ABSTRACT There are a number of factors fueling the growth of large group practices managed by corporations across the U.S., including California. These evolving trends are shaping the dental profession and practice models in a variety of ways.

Large group practices managed by dental support organizations have grown significantly in recent years — there are now nearly 2,900 nationwide. In addition, corporations with more than 200 dental practice locations grew an average of 35 percent between 2013 and 2015. In California, an estimated 555 corporate locations provide dental care to patients, including Pacific Dental Services Inc., Smile Brands Inc. and Western Dental, among others.

An ADA “Distribution of Dentists” survey confirms the trend, revealing that the proportion of dentists who own practices dropped from 91 percent in 1991 to 84.8 percent in 2012, and the proportion of solo practitioners dropped during that same time from 67 percent to 57.5 percent.

In the dental profession, there is a variety of business models taking shape, but in general, these corporate-managed practices employ clinical care providers and are managed by dental support organizations that deliver nonclinical services such as human resources, marketing and office support management.

Attributing factors to the growth in corporate managed models include downward pressure on health care costs, which creates a need to innovate with new delivery systems, an attraction of private equity and other investors, the ability of dental service organizations to achieve better economies of scale than solo practices, and high student loan debt, as well as shifting demographics that indicate new graduates desire a work-life balance and flexible schedules. The growth in corporate practices is similar to what occurred in the pharmacy profession between the late 1950s and 2000s, with a significant drop in the percentage of independent pharmacists and an increase in those working for corporations. How that plays out in dentistry is unknown, but the ADA expects corporate group practices to continue their growth to an estimated 20 percent of all dental practices nationwide by 2020.

“As the dental profession evolves, CDA continually looks for ways to best serve members, regardless of their practice model,” said immediate past CDA
President Walt Weber, DDS. “CDA’s goals emphasize the need to provide value to current and future members, whether they provide care in a private practice, group practice or a large group practice managed by a dental support organization.”

CDA’s Dental Benefits Research Task Force first analyzed these shifts in practice models several years ago and recently, in response, CDA created a new subsidiary called The Dentists Service Company (TDSC) to help members with the business side of their practices to be more competitive and efficient. While ensuring all clinical-care decisions and practice ownership remain with dentists, TDSC, which is in a development phase, plans to offer group purchasing of supplies, practice advising, marketing, human resources and assistance with forming group practices to help members navigate through the trend.

The ADA Health Policy Institute has conducted research on the dental marketplace, including a recent study that examined how dentists view different aspects of solo, small group and large group practices. The survey measured satisfaction with income, benefits, hours worked, clinical autonomy, work-life balance, emotional exhaustion and overall satisfaction among dentists working in large group, small group and solo practice settings. Findings suggested that dentists working in small group settings reported the most satisfaction overall. Dentists working in large group settings reported more satisfaction with income and benefits than dentists in solo practice, as well as having the least stress. More information about ADA’s studies can be found at ada.org.

CDA will continue to keep members informed about emerging trends in the dental marketplace and the development of The Dentists Service Company, as well as provide sophisticated practice management resources through CDA Practice Support, which can be found at cda.org/practicesupport. ■
LOS ANGELES COUNTY


GLENDALE—GP w/ 3 eq ops, 1 plumbed not eq. Digital X-ray. No HMO. Buyer’s net of $224K. Minutes away from Rose Bowl. Property ID #5045.

HUNTINGTON PARK (GP) - 30 years of goodwill located in strip shopping center. 3 equipped ops. Some Dentical. Buyer’s Net of $105K. Property ID #5054.


N. HOLLYWOOD—Digital general practice located in a single story bldg w/5 eq ops. Reasonable lease. Fee for service. 30 years of goodwill. Grossed approx. $453K for 2015 on a 1 day/wk schedule. Property ID #5089.

POMONA—Leasehold Improvement and Equipment Only! Modern designed office w/4 ops in a single professional bldg. Property ID #5057.

TORRANCE (GP) 30 years of goodwill in a 3 story medical/dental bldg. 5 equipped operators. Prog. approx. $90K for 2015. Net of $103K. Property ID #5036.

WEST COVINA—Leasehold Improvement and Equipment Only! Beautiful office w/3 eq operators in a new construction. Located in a new commercial plaza. Great opportunity. Property ID #5077.


OREGON COUNTY

MILWAUKI VILLAGE—Leasehold Improvement and Equipment Only! Beautiful office w/3 eq operators and 1 plummed not eq. Located in a 2 story medical / dental building. Equipment is approx. 2 yrs old. Great opportunity. Property ID #5095.

NEWPORT BEACH—Established in 2002 this GP is located in a new bldg w/6 eq ops and 1 plummed not eq. PPO and Cash only. Projecting $663K for 2015 with a Buyers net of $140K. Property ID #5086.

ORANGE—GP w/ over 42 yrs of gdwil located in a free standing bldg on a major Ave of Orange w/plenty of heavy traffic. Net of $34K. Property ID #5059.

ORANGE—Leasehold Improvement and Equipment Only! Modern designed practice w/4 spacious ops in single story free standing bldg. Walking distance from the circle of Orange. Property ID #5082.


SAN DIEGO COUNTY

EL CENTRO (GP)—Price Reduced!! This practice is located in a single story building. Building is for sale. 5 equipped operators. Grossed approx. $331K for 2015. Buyer’s net of $555K. Property ID #5023.


POWAY—GP w/ 20 yrs of gdwil. Has 2 eq ops & 1 plumbed not eq. Gro. approx. $188K for 2015. Property ID #5084.

RIVERSIDE & SAN BERNARDINO COUNTY

APPLE VALLEY-3 equipped operators. Seller is working 4 days/wk and sees ~15-20 patients/mo. Monthly revenues of $43K. Net of $14K. Property ID #5050.

CHINO—Leasehold Improvement and Equipment + Condo. 4 chairs in open bay in single strip mall. This facility has been always at this location for 40 yrs. Property ID #5076.

INDIAN WELLS (GP)—Price Reduced!! Modern designed practice with 4 equipped operators in a 2,850 sq ft office. In shopping plaza. Property ID #5061.

PALM DESERT—Well established practice in a free standing bldg. This modern designed practice consists of 5 eq ops in a 2,800 sq ft office. 100% patient referral. Insurance and Cash only. Runs 8 days of hygiene. Net of $514K. Property ID #5058.


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CA BRE #00283209
It’s never been truer that a picture is worth a thousand words. As websites and social media increasingly become preferred channels for sharing our stories, photographs can be the best way to show exceptional experiences at your practice. Life-changing restorative work, happy patients and healthy smiles are all powerful stories. But whose stories are they to share? Yours or your patients?

With permission from your patients, you can use their photos to promote your practice on your website, as well as for articles, lectures and advertisements. Without permission, there are significant headaches and legal risks.

In a recent case, a dentist used before-and-after photographs on his practice site to showcase his excellence in restorative work. The images were only of the patient’s mouth, and no patient-identifying information accompanied them. However, when the patient saw and recognized her own smile online, she became distressed due to embarrassment about her “before” photos. She also expressed that she didn’t want others to know her smile had been restored, and moreover that she hadn’t agreed for the practice to use her photographs. Though the patient had signed a release before treatment, the release did not specify possible use of the patient’s photos. The patient is now demanding that her before-and-after images be removed from the site, all photos taken of her at the practice be released to her and financial compensation for unauthorized use of her photos. The situation could have been avoided with a simple line specific to use of photos within the dentist’s existing release form.

Even with signed authorization, patients can be sensitive to how their images are used. In a separate case, a patient was surprised to see her photo on the website of the practice where she receives treatment, even though she had signed a release that did include permission to use photos. The photo did not show, and no other information revealed, the type of...
treatment she’d received. She expressed unhappiness simply from the fact that others now knew she was receiving dental care at the practice. Though the dentist in this case was legally protected by the signed release, the issue still created stress for the patient.

The use of patient photographs shouldn’t be determined by legal requirements alone. It must also be solidified by patient relationships and practice reputation. For example, if an individual featured on a practice website is no longer an active patient or the patient relationship has since changed, it’s prudent to replace the photo. And, if a patient will be prominently featured on the site, it’s respectful to have an image release on file.

Of course, it’s not just patients who need to consent to use of their photos. If members of your practice team are featured on your website, you’ll want to have signed releases from them as well. Whether featured in their professional roles or as patients of the practice, the same considerate photo releases measures should be taken.

The Dentists Insurance Company, TDIC, provides policyholders access to a full library of forms and templates to help mitigate risk, including an Image Release Form. Whether you choose to use TDIC’s form or create your own, your release should include:

- Language that specifies consent to use photos in print and electronically, including on your practice’s website.
- A distinct section with language that specifies use of photos that must be consented to and signed.
- Details how their images may be used and through which channels.

An image release allows your patients to have more awareness of giving consent to use photographs, instead of “skim reading” as they complete many other forms. In addition, it allows patients to decline consent to use their photos.

Remember, the stories you share through photos aren’t just the stories of your practice’s success. They can also be your patients’ personal stories of transformational moments of regained confidence in their new smile. Foster trusting relationships by communicating early and gaining consent to share those stories through pictures.

TDIC’s Risk Management Advice Line at 800.733.0634 is staffed with trained analysts who can answer patient consent and other questions related to dental practice.
Lee Skarin and Associates has been serving the dental profession since 1959.
Kurt Skarin has over 30 years experience in dental practice sales.
We have sold more practices than any broker in the state within the last 12 months.
Our experienced practice appraisals are backed with credentials unequaled among dental practice brokers.
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Visit our website for current listings: www.LeeSkarinandAssociates.com

Dental Practice Brokers CA DRE #00863149
6102 SAN RAFAEL 2-op practice collects $250,000 per year. 
6101 SAN MATEO Attractive start-up opportunity. Gets little attention due to Owner’s busy SF practice. 4-ops. Digital radiography, paperless files and upgraded suite. 320 different patients treated since opening. 
6100 SANTA CLARA Phenomenal platform for Ambitious Successor. Great location, 5-op facility. Management is not taking advantage of what is possible here even though 2015’s collections totalled $768,000. Perfectly positioned to be a $1 Million+ per year performer. 
6099 FAIRFIELD Long established practice collected $500,000 in 2015. 3-days of Hygiene. 4-ops with digital radiography. 
6098 WEST PETALUMA On 4-day week, collected $468,000 with Profits of $199,000 in 2015. Averages 15 new patients per month. Great views. 
6097 SAN FRANCISCO’S PARKSIDE DISTRICT Part-time practice collected $130,000+ in 2015. 2-ops with separate digital x-ray room. 3rd op available. Great opportunity for someone looking to enter private practice with low start-up costs. 
6096 NORTH FRESCO’S ST. AGNES MEDICAL VILLAGE Long established. 4-days per week of hygiene. Realized collections of $425,000 in 2015. 4-ops with 3 upgraded. Full Price $150,000. 
6095 WEST CONTRA COSTA COUNTY’S PINOLE Located off Interstate 80 in Contra Costa Village alongside Appian Way. 3-days of Hygiene. 4-ops tracking $425,000 in collections. Delivery systems in ops were upgraded 11-years ago. 
6094 PERIO PRACTICE - SAN FRANCISCO BAY AREA This offering shall appeal to the Periodontist who wants a high-end practice in an extremely desirable area. 2015 Produced $1.25 Million, collected $1.25 Million and realized Available Profits of $690,000 on 3-day week. 
6093 CENTRAL MARIN COUNTY Located in hub of Marin County. Consistent $700,000/year performer with strong Profits. 3-days of hygiene. Digital office. 
6092 ROSEVILLE 2015 trending $350,000. 3-ops with 4th available. Convenient location near Douglas Boulevard. End cap suite in strip center with fantastic exposure. 
6087 LAKE TAHOE NEVADA’S STATERLINE “Fee-for-Service” as practice is “out-of-network” with insurance companies. Collections last year topped $600,000 with Profits of $220,000. 3.5 days of hygiene per week. Nevada State Board of Dental Examiners accepts the Western Boards. 
6085 VISALIA Strong foundation and well-positioned for successor. Strong Hygiene Department, beautiful facility, well equipped. Digital throughout. 2015 collected $727,000 on part-time schedule. Extend hours and be busier. Best location!
Sales and Use Tax

CDA Practice Support Staff

Dentists pay state sales tax on materials, supplies, dental laboratory products and other “tangible personal property” that are used in the performance of their services. Dentists pay the tax upon purchase and the seller collects the tax and forwards it to the state. Dentists may have another role in the collection of sales tax — a dentist who sells products may be required to have a seller’s permit, to collect sales tax and to report the tax to the state.

Use tax is similar to sales tax, except that it is the purchaser, not the seller, who pays the tax directly to the state. Use tax is applied to purchases from out-of-state vendors when the items are to be used or consumed primarily in California and the seller has not collected California sales tax. Use tax rates are the same as sales tax rates, and products and services that are exempt from state sales tax are also exempt from use tax.

Collecting Sales Tax

A dentist must collect sales tax when selling an item on which no sales tax was paid to the supplier or the sale price is higher than what the dentist paid for an item. If a dentist purchases and pays sales tax on a product, then sells the same product to a patient at a price higher than originally paid, the dentist must then collect sales tax on the difference between the purchase price and the selling price. If a dentist sells a product without a markup in price, and sales tax was already paid to the original supplier, the dentist does not have to collect sales tax from the patient. Retain documentation of purchases and sales even when selling a product at cost. A dentist who collects sales tax must have a seller’s permit issued by the state Board of Equalization. Sales tax must be regularly reported.

Tangible personal property sold by dental practices for which sales tax must be paid includes toothbrushes and teeth whitening kits. Services that may include an incidental transfer of property are not subject to sales tax. An example of such services is in-office teeth whitening where a tray is fabricated and given to the patient.

Sales tax does not apply to medicines furnished by a dentist to a patient in the course of treatment. Tax also does not apply to sales of medicines to licensed dentists for use in treating patients. The regulatory definition of “medicines” includes permanently implanted articles such as dental implant systems, including dental bone screws and abutments.

Orthodontic appliances are specifically excluded from the definition of “medicines,” as are auditory, ophthalmic, ocular or some prosthetic devices or appliances. The dentist typically pays sales tax to the supplier or lab.

Dental laboratories are the retailers of the plates, inlays and other products that they manufacture for dentists or other consumers. Tax applies to their entire charges for such products regardless of whether a separate charge or billing is made for materials and manufacturing services.
Paying Use Tax

Use tax has been collected in California since the 1930s but it was not until 2009 that the state began to require “qualified purchasers” who generate $100,000 in revenue annually from business operations (this includes most dental practices) to register with the Board of Equalization in order to report use tax owed. Separate registration is not required if a dentist already holds a seller’s permit, a use tax direct payment permit or is otherwise registered with the Board of Equalization. California also requires out-of-state retailers to register and report use tax.

Tax Rates and Other Information

Tax rates vary by county and city. Tax rates and other information on sales and use tax can be found on the Board of Equalization website, boe.ca.gov/sutax/sutaxprograms.htm. Regulation 1506 — Miscellaneous Service Enterprises — and Regulation 1591 — Medicines and Medical Devices — apply to dental practices. Use the search box on the website to locate the text of these regulations. Regulation 1591 provides the full definition of “medicines” that are exempt from sales and use tax and describes items that are excluded from that definition.

Regulatory Compliance appears monthly and features resources about laws and regulations that impact dental practices. Visit cda.org/practicesupport for more than 600 practice support resources, including practice management, employment practices, dental benefit plans and regulatory compliance.
4085 SANTA ROSA GP & BUILDING
Practice and real estate are offered for sale in a well-established condominiumized medical/dental complex conveniently located in the heart of Santa Rosa, near Memorial Hospital. This 1,200 sq. ft. single story office is centrally located in a desirable, mixed use commercial and residential corridor known as Doctors Row. The office comes equipped, furnished and ready for you to continue your professional career with established and new patients (approx. 750 active patients).

Tastefully decorated with a homey décor, the practice has 3 fully equipped ops, reception area, private office, staff lounge, etc. Seller is retiring after almost 20 years but will assist for a smooth transition. Average Gross Receipts of $256K with adj. net of approx. $110K. Asking price $160K for the practice, and $270K for the real estate.

4091 HOLLISTER GP & PEDIATRIC
Country living at its best ~ small town community feel with affordable housing, in quaint bedroom community to Silicon Valley. General and Pediatric practice located in corner professional building on well-travelled street near Hazel Hawkins Hospital. Fully-equipped 1,600 sq. ft. office with 2 enclosed adult ops and 3 open pedo ops. Great opportunity for a turn key practice with trained staff and approximately 700 active patients. 2014 GR $228K. Seller is relocating out of the area, but will help for a smooth transition. Asking price only $125K.

4090 SANTA CLARA DENTAL FACILITY
Turn-key dental facility in highly visible 30 year old modern, commercial & professional mix building with large daytime business draw & large residential population, in a well-travelled area. Dental practice has been at this location for 30 years. Seller has relocated & is offering 6 fully furnished & functional operatories. Office remodeled in 2010. 2,240 sq. ft. suite includes large waiting room, large front office, central lab, 2 private offices, break room & bathroom. Existing lease has 4 options to renew for 5 years.

4089 SUNNYVALE GP
Extremely desirable location on the corner of two well known major cross streets with easy freeway access. Beautifully appointed practice with 5 plumbed, 4 fully equipped ops. Lots of natural light and a team setting. Seller is offering 12 years of goodwill and lease. 500 active patients. Average gross receipts (last 3 years) $328K with an adjusted average net of $122K. Seller will help for a smooth transition. Asking price $250K.

4084 SAN BRUNO GP
Located in Tanforan Shopping Center. 2014 Gross Receipts $279K. Convenient, spacious design, 5 cp.& private office. Asking $175K.

4093 SAN JOAQUIN VALLEY ORTHO
Established over 35 years with a solid reputation, near several referral sources in seller owned building, 2,500 sq. ft. office with 7 chair open bay in professional center on a well-travelled street with many retailers. Avg. Gross Receipts $763K. Seller retiring and willing to help for smooth transition. Asking $561K. The building is available to purchase as well for $608K.

4086 SILICON VALLEY PERIO
Well-established Perio practice in prime San Jose location with referral sources nearby. Located in a commercial & residential mix neighborhood with a large daytime business draw. Approx. 1,100 sq. ft. office with 4 fully-equipped ops. Well trained dedicated staff, seller retiring and willing to help for smooth transition. 2014 GR $482K+, 2015 on schedule for $539K+ as of August. Asking $295K.

4065 LAKE COUNTY GP
Seller retiring from general practice located in a slower paced, relaxed community. Plenty of hunting and fishing and out door activities for the enthusiast. Approximately, 1,600 square foot office with 4 fully-equipped operatories. Over 2,000 active patients, average $697K+ in Gross Receipts with an overhead of just 56%, and 4 doctor days per week. Asking $463K.

4088 NEWARK/FREMONT DENTAL FACILITY
1,400 sq. ft. facility with 4 fully-equipped operatories setup for right-handed delivery, reception area, private office, consult room, staff lounge, lab area, sterilization area, storage area, 2 bathrooms, common area and plenty of parking. Located in mall close to new housing. Lease expires in 3 years with 5 year option to renew. Landlord willing to negotiate new 10 year lease at a fair market rate. Equipment list available. Asking $80K.

4095 SAN MATEO GP
San Mateo solo-group practice in a split level dental building on a well travelled corner close to downtown and Caltrain station. Shared office space in seller owned suite is approximately 2000 square feet with 3 fully-equipped operatories and private offices. Seller is willing to negotiate lease or sell his interest in the building to the practice buyer, 2014 GR $650K Average overhead is 63%. Seller is transitioning into retirement. Asking $471K for the practice.

Carroll & Company
2055 Woodside Road, Ste 160
Redwood City, CA 94061
P (650) 362-7004
F (650) 362-7007
dental@carrollandco.info
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CA DRE #00777682

Mike Carroll
Pamela Carroll-Gardiner

www.carrollandco.info   dental@carrollandco.info
P (650) 362-7004   F (650) 362-7007
AC-335 SAN FRANCISCO: Great Practice! 2100 sf, 8ops in desirable location. $475k
AN-514 SAN FRANCISCO Facility: Located in the bustling financial district! 1,007 sf w/4 ops. Reduced to $125k
BN-279 CONTRA COSTA COUNTY: Excellent Merger Opportunity! 2-story. 1,350 sf w/ 2 ops + 2 add'l. $60k
BC-361 OAKLAND: Established for over 23+ years! 2,200 sf w/ 7 ops. Now Only: $330k
BC-509 SAN LEANDRO: Facility Only, 800 sf, 3ops w/xray in each op. Call for Details $60k
BC-520 HAYWARD Facility: 3ops w/ xray in each op. Call for Details $65k
BC-361 OAKLAND: Prof bldg. Great signage! 1,200 sf w/ 3 ops $125k
BC-432 PITTSBURG: Own this family-oriented Practice! 1,640 sf w/ 6 ops. $350k
BN-463 FREMONT: Gross Revenues Exceeded $590k in 2014 on 4 day work week! 1,720sf w/ 3 ops + 4 add'l. Now Only $435k!
BN-504 RICHMOND: Established Practice and Real Estate! 1,450 sf w/ 2 ops + 2 add'l! $100k/RE $700k
BN-505 CONCORD Facility: The essence of comfort and functionality. 800 sf w/ 3ops. $40k
CC-456 SOLANO COUNTY: Highly visible! 2,997 sf w/ 6 Dr ops + 2 Hyg ops + 1 add'l! $850k
CG-537 MARIN COUNTY: Rare Opportunity in upscale, highly desirable area. State of the art office. 2,400 sf w/ 7 ops $1.1M
CN-482 SANTA ROSA: Rare Opportunity in highly desirable area. 1050 sf w/ 3 ops HEALTH FORCES SALE – ONLY $98k
CN-532 NAPA: Perfectly situated, this premier practice is located on a primary thoroughfare! 1900 sf w/ 5 ops + 1 add'l! $850k
DC-476 DUBLIN: Shared Facility. Great for Specialist - Endo, Pedo or Ortho. 1100 sf w/ 2 ops+1 add'l! $125k
DC-522 PLEASANTON: Location, Location, Location! Do not pass this opportunity! 2ops in 712sf office $149k
DG-499 SANTARA Facility: 2 fully equipped ops & room for 1 add'l w 1,178sf. Move-In Ready NOW ONLY $80k
DG-510 SAN JOSE: Be the envy of all in a much coveted location in a large, upscale, nationally-owned Mall! 1,450 sf w/5ops. $1.1 mil.
DN-467 GILROY Facility: This traditionally styled practice is perfectly situated! 1,325 sf w/ 3 ops + 1 add'l. $75k
DN-497 PLEASANTON Facility: Great Location! 870 sf w/ 3 ops + 1 add'l. Owner Financing w/10% Down! Reduced! $95k
DN-529 CUPERTINO: Must See to Appreciate! High-End Quality Practice. 4 ops w/1,664 sf $320k
EG-479 FOLSOM Facility: 2,997 sf w/ 6 Dr ops + 2 Hyg ops +1 add'l $40k
EN-340 SACRAMENTO: Great Location! 2100 sf w/ 3ops, 10-15 new pts/ mo $225k
EN-464 ROCKLIN Facility: Don’t miss out on this remarkable opportunity! 2,150 sf w/ 4 ops. Now Only: $100k
EG-491 FRESNO Facility: History is alive here with tributes to the past! 1,600 sf w/ 3ops, $225k
EN-474 STOCKTON: Hesitate and you might miss out on this opportunity! 875 sf w/ 2 ops + 2 add'l. $49.5k
FN-299 FERNDALE: Only $315k
EG-491 FRESNO Facility: History is alive here with tributes to the past! 1,600 sf w/ 3ops, $225k
FN-527 TRINITY COUNTY: Practice $535k Real Estate $750k
FR-415 FT. BRAGG: $480k Real Estate Also Available!
GH-453 CHICO: $395k
HC-461 SONORA: NOW ONLY $99k
HG-298 REDDING FOOTHILLS: HEALTH FORCES SALE!
GN-244 OROVILLE: $225k
GN-258 REDDING: $75k
GN-399 REDDING: REDUCED: $375k
HN-290 PLACERVILLE: Excellent Merger Op!
HN-290 PLACERVILLE: Perfectly situated, this premier practice is located on a primary thoroughfare! 1,934 sf w/ 4 Ops. $125k
IC-543 CENTRAL VALLEY Ortho: No reason - ers considered! $350k
IN-474 STOCKTON: Price Reduced. All o
JC-541 FRESNO Facility $425k
JC-540 FRESNO Sleep Apnea $425k
JG-491 FRESNO: $350k
JG-491 FRESNO: ONLY $275k
JJ-299 FRESNO: $95k
JJ-299 FRESNO: Call for Details!
JC-540 FRESNO Sleep Apnea $425k
EN-464 ROCKLIN Facility: Don’t miss out on this remarkable opportunity! 2,150 sf w/ 4 ops. Now Only: $100k
EN-474 STOCKTON: Hesitate and you might miss out on this opportunity! 875 sf w/ 2 ops + 2 add'l. $49.5k
EN-464 ROCKLIN Facility: Don’t miss out on this remarkable opportunity! 2,150 sf w/ 4 ops. Now Only: $100k
HJ-527 TRINITY COUNTY: Practice $700k & Real Estate Also Available!
HG-448 LAKE TAHOE AREA: Call for Details! $210k
HG-448 LAKE TAHOE AREA: Call for Details! $210k
HG-448 LAKE TAHOE AREA: Call for Details! $210k
HG-448 LAKE TAHOE AREA: Call for Details! $210k
HG-448 LAKE TAHOE AREA: Call for Details! $210k
NORTHERN CALIFORNIA CONTINUED

**EG-508 FOLSOM Facility:** You’ll want to spend your days here! 1,500 sf w/ 4 ops + 1 add’l Reduced for quick sale! **$60k**

**EN-516 CITRUS HEIGHTS:** well-established, quality practice is loaded w/30+ years of goodwill. 1,358 sf w/ 3 ops + 2 add’l $140k

**EG-521 FOLSOM Facility:** Stands out above the rest! Don’t Miss this one! 1,200 sf w 3 ops. Well Equipped! **$99k**

**EG-526 CARMICHAEL:** Relocating and leaving 30 yrs Goodwill behind! 1,350 sf w/ 4 ops & opt to grow! REDUCED: **$375k**

**EN-524 SACRAMENTO:** The possibilities are endless with this opportunity! 2,400 sf w/ 3 ops + 3 add’l **$220k**

**FN-299 FERNADEL:** Live and practice on the beautiful North Coast! 1,100 sf w/ 3 ops $195k (Real Estate: $309k)

**FC-334 NORTHERN CA:** Emphasis on prevention. 1,200 sf w/ 4 ops $480k / Real Estate Also Available!

**FC-415 FT. BRAGG:** Excellent Practice! Dr. avgs 18+ pts/day & 20+ npts/mo, 1,800 sf w/ 5 ops + 1 hyg. Op **$425k**

**FC-489 CLEARLAKE:** Located on “4-Corners” of Hwy 53, 40s in shared 3600sf facility. $470k / 50% interest in RE Also Available

**FN-527 TRINITY COUNTY:** Be the only dentist in town! *Pride Institute* designed! 2350sf w/ 5 ops + 1 add’l. **$325k**

**GC-472 ORLAND:** Live & Practice in charming small town community. 1,000 sf w/ 2ops. Seller Retiring. **$160k**

**GG-386 REDDING:** Amazing Practice. Lease or Buy Real Estate! 2,860 sf w/ 4 ops. Plumbed for 2 add’l! ONLY **$275k**

**GG-453 CHICO:** 5,000 sf w/ 7 ops Perfect for 1 or more dentists! **$395k**

**GG-454 PARADISE:** ~2,550 sf w/ 9 ops. 40 yrs goodwill! Amazing Opportunity! **$595k**

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

**GN-258 REDDING:** Pristine and attractive! Conveniently located! 2,100 sf w/ 3 ops + 2 add’l. Now Only **$300k**

**GN-399 REDDING:** Loyal patient base and relaxed workweek schedule. 1,440 sf w/3 ops. **$150k**

**GN-418 REDDING:** Goodwill Galore! Established for ~37 years. Seller is retiring! 3,200 sf w/6 ops +2 add’l. **$495k**

**GN-507 CHICO:** It just doesn’t get any better than this! 3,000 sf w/ 7ops. Practice **$535k Real Estate $750k**

**HC-461 SONORA:** In the beautiful Sierra Foothills, 4ops, 1350sf, free -standing bldg. Practice **$700k & RE Also Available!**

**HG-298 REDDING FOOTHILLS:** HEALTH FORCES SALE! Includes Cerec! 2,000 sf w/ 5 ops. Practice **$75k & Real Estate Also Available!**

**HN-280 NO EAST CA:** Only Practice in Town 900 sf w/ 2 ops **$110k**

NORTHERN CALIFORNIA CONTINUED

**HN-290 PLACERVILLE:** Excellent Merger Op! FFS. 1,400 sf w/ 4 ops **$210k**

**HG-448 LAKE TAHOE AREA:** Call for Details! Upscale Family Practice. 3400sf w 6 ops **$725k**

**CENTRAL VALLEY

**IC-468 SAN JOAQUIN VLY:** High-End Restore Practice! 2500+sf, 6 ops, Price Reduced. All offers considered! **$350k**

**IN-397 FRESNO/MADERA:** Focused on quality dental care & patient comfort! 2,000 sf w/5ops. Seller Motivated: **$440k**

**IN-429 TRACY Facility:** “Move-in ready” Hesitate and you might miss out! 2,488 sf, 5 ops $245k/RE: **$650k**

**IN-474 STOCKTON:** Too good to be true? Absolutely not! 1,600 sf w/ 3 ops. **$95k**

**IN-506 TURLOCK:** Practice in the heart of the Central Valley! 2,000 sf w/ 5 ops + 1 add’l. **$425k**

**IN-512 MERCED:** This immaculate practice is an absolute jewel! 1,200 sf w/ 4ops + 1 add’l. **$140k**

**IC-541 FRESNO Facility:** 1,210 square feet and consists of 2 fully equipped ops and plumbed for add’l op Call for Details!

**JG-491 FRESNO:** Well-established. 40-50 new Pt/ mo. 1,452 sf w/ 4 fully equipped ops **$425k**

**SPECIALTY PRACTICES

**BG-517 NORTH EAST BAY Endo:** 2,750 sf w/ 8 ops! Strong Practice! **$500k**

**CC-346 SO MARIN CO Perio:** Beautiful 1,142 sf w/ 3 ops. No reasonable offer will be refused! **$199k**

**CG-424 NAPA Prosth:** Office has Digital X-ray & NEW 3D Imaging Unit! Ready for Experienced, high-end Prosthodontist! On track to collect just under $1m **$725k**

**DC-459 SF PENINSULA Perio:** 50% Partnership Buy In! Call for Details! **$580k**

**FN-536 LAKE COUNTY Pedo:** Focusing on Prevent dental problems before they begin! 1,750 sf w/3 ops. **$325k**

**IC-543 CENTRAL VALLEY Ortho:** 1,650 sf w/5 chairs/bays & plumbed for 2 add’l! **$180k**

**JC-540 FRESNO Sleep Apnea:** Motivated Seller retiring! Step right in and make yours! Call for Details!

“Ask the Broker” can now be found at www.westernpracticesales.com
A look into the latest dental and general technology on the market

Dental Drugs (Rami Ammoun, Free)

Many practicing dentists have some form of reference for the most commonly prescribed drugs at their fingertips. These references have made their transition from print to digital in the form of useful mobile applications. Dental Drugs is an app that provides a quick reference to medications as well as common treatment protocols to efficiently assist dentists in their practices. Dental Drugs is divided into drugs, anesthetics and treatment protocols reference areas. The drugs reference area contains lists of commonly prescribed medications that are categorized by class. When a specific medication is selected, details of the drug are displayed along with recommended prescriptions based on the drug strength chosen by the user. Selecting a drug strength can be non-intuitive and difficult because the field to scroll through the various dosages is quite narrow. Information regarding drug precautions and complications are integrated in the drug display view. Detailed information for a drug can be easily emailed to a patient by tapping on the new message icon located on the upper right. The anesthetics reference area contains a list of local anesthetics grouped by their duration. Selecting a local anesthetic uncovers duration details as well as a calculator that can approximate maximum dosages based on an estimated patient weight that can be entered by the user. The treatment protocols reference area contains a short list of treatments for common dental conditions. The list and details of the various treatment protocols can be edited based on practitioner preferences. Dental Drugs provides invaluable medication and protocol information for dentists in a readily available and conveniently accessible way.

— Hubert Chan, DDS

Stick Up Cam (Ring, $199)

Billed as a companion device for Ring’s Video Doorbell, the newly released Stick Up Cam offers similar functionality with expanded mounting capabilities. Similar to the Video Doorbell, users of the Stick Up Cam are able to see, hear and speak with visitors using their iOS or Android smart device, from anywhere on the planet (so long as they have an active Internet connection). With automated motion detection, two-way audio, six- to 12-month battery life, night vision and cloud-based storage of recorded videos, Ring is counting on both the ease of installation as well as ease of use to differentiate its products within an increasingly crowded security camera marketplace. While the Video Doorbell has a physical doorbell button for visitors to push, the Stick Up Cam is intended to be placed beyond the reach of any individual, as it is more of a security camera to be mounted higher up and angled to look down at areas such as the side or back of a house. It connects to the same Ring app and provides the same motion notifications, while also providing two-way audio communication and one-way video recording. If you’re looking for a security camera with a lot of functionality and minimal difficulties to install and utilize, this could be the right solution for you.

— Blaine Wasylkiw, CDA director of online services

MyShake (UC Berkeley Seismological Laboratory, Free)

UC Berkeley wants your help to increase warning times of earthquakes. The school’s new MyShake app uses the accelerometers built into smartphones (which are used for games and to help sense motion such as running and walking) to record seismic activity. The app then sends the data through the phone’s GPS to the Berkeley Seismological Laboratory for analysis. UC Berkeley said the sensors in smartphones are capable of detecting earthquakes above magnitude 5. Think of it as crowd-sourced seismic data through the estimated 1 billion smartphones worldwide. The end goal is to collect enough data to come up with a strategy to warn of earthquake activity in developing countries like Nepal and Peru. The MyShake app is currently only available on Android devices.

— Blake Ellington, Tech Trends editor
What will you discover in Anaheim?

Innovation. Explore new products and services from hundreds of companies, and try them yourself at CDA Presents. Get a first look at new tech and save big with convention discounts.
With no impressions or custom trays necessary, Opalescence Go is ready to use right out of the package! The comfortable, adaptable UltraFit™ pre-filled tray provides molar-to-molar coverage, and quickly adjusts to any smile.