Safety in DENTISTRY

Part 1 Perspectives and Directions

David L. Rothman, DDS
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SAFETY: IT'S NOT EXCITING BUT SURE IS NECESSARY

An introduction to the issue.

David L. Rothman, DDS

INTRODUCING SAFETY IN DENTISTRY: PERSPECTIVES AND DIRECTIONS

Safety conventions and initiatives have slowly begun to materialize in dentistry but have lagged behind their medical counterparts.

Alfa Yansane, PhD; Muhammad F. Walji, MS, PhD; and Elsbeth Kalenderian, DDS, MPH, PhD

CHECKLISTS AS TOOLS FOR IMPROVING PATIENT SAFETY IN DENTISTRY

Checklists have emerged as practical and effective tools for realizing a safer health care environment.

Oluwabunmi Tokede, DDS, MPH, and Elsbeth Kalenderian, DDS, MPH, PhD

THE COST OF NOT PRACTICING SAFELY: PERSPECTIVES IN THE LEGAL PROFESSION

This article elucidates the legal ramifications of the unsafe practice of dentistry.

Steven D. Barrabee, Esq.

MAKING DENTISTRY EVEN SAFER: UNDERSTANDING THE PROPER CHOICE AND USE OF EMERGENCY MEDICATIONS

Oral health care practitioners and the entire office team must be vigilant in recognizing signs of patient distress and trained to take appropriate action when needed.

Mark Donaldson, BSP, ACPR, PharmD, and Jason H. Goodchild, DMD
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In September 2018, Senate Bill 1343 was signed into law. Beginning Jan. 1, 2019, the law requires expanded training on sexual harassment prevention for all employees. The impact of SB 1343 will be felt in every dental practice in California with five or more employees. The training must be completed by Jan. 1, 2020, and must be repeated every two years. SB 1343 distinguishes between employees with supervisory oversight and those employees who are supervised. The former require a two-hour training and the latter require a one-hour course. Training must be completed within six months of hire or promotion to a supervisory position. In addition, beginning Jan. 1, 2020, temporary employees will need to be trained (or show proof of prior compliant training) within 30 days or 100 hours of employment, whichever comes first.

Our California law is more comprehensive than the federal version. Our state law specifies strict liability, that is, the employer has no defense if a manager or supervisor is the harasser. In addition, California includes volunteers and unpaid interns within the group that must receive training. For a full review of the new requirements for employers, see Steps to Harassment, Discrimination and Retaliation Prevention Guide on the CDA Practice Support webpage.

CDA has developed a webpage dedicated to information that members need to know to comply with harassment prevention laws. Policy development, distribution, employee notice requirements and training are all addressed. Members can access the information at cda.org/member-resources/practice-support/employment-practices/harassment-prevention.

That is a summary of the changes that employers are challenged to comply with prior to the Jan. 1, 2020, deadline and beyond. This is the point at which this article could veer into a diatribe against regulation. Some folks might rail against the slings and arrows of outrageous fortune that drain energy and attention from providing patient care and divert it to crossing t’s and dotting i’s in order to remain in compliance with government regulations. Some might go on about how this is the least fulfilling part of our activities as dentists. Some might throw up their hands and blame the new requirements on a bunch of snowflakes that cannot take a joke … but I will not. I will not, because I actually think these new requirements are a good thing. The basis of this legislation and the simple principle is: Each of us should have the right to have a personal sense of dignity and well-being at work. It really is pretty simple. However, assuring dignity and well-being does not come naturally or easily for everyone. That may be especially true in today’s normalized climate of attack and defense, insult and offense.

Maintaining decorum in the professional space is really what is being called for. Merriam-Webster defines decorum as fitness, orderliness and the conventions of polite behavior. The dictionary goes on to define polite as marked by an appearance of consideration, tact, deference or courtesy … marked by a lack of roughness or crudities.

Consideration, tact and courtesy: Is that really a burden? Surely we should all expect to operate with the decorum appropriate for a professional environment in our dental practices. Why should consideration, tact and courtesy be viewed as a penalty? Somehow, decorum has taken on a diminished connotation of cold indifference or even hostility. Some folks feel that there is something wrong with striving to foster and support the appropriate office decorum. It seems as if the preferred office behavior, for some, should be casual and family-like.

It is easy to understand why family-like interactions could cause problems in a professional setting. A special field of psychological counseling exists that is dedicated to marriage and family therapy. Its goal is to help individuals come to terms with familial social interactions. This should give us some hint that this kind of setting could lead to highly emotionally charged interactions.

Some people feel the interactions in the office should reflect friendship and camaraderie not unlike what one might experience in a locker room. But the locker room is a psychosocial minefield of its own. I remember complaining to a friend in dental school that it was very tiring having to ignore the sexist jokes and graphic posters in our preclinical lab. My friend suggested that the jokes and posters were just manifestations of being...
accepted into the “locker room.” It meant I was accepted as one of the boys, part of the group. But the jokes were not clever and the poster objectified my gender. The environment did not feel welcoming. It did not feel considerate. There was no sense of decorum. It certainly was not polite behavior. It did not engender respect or dignity.

I like to think that the discomfort that some of us experienced as sexual harassment in dental school is a thing of the past. Today’s environment is surely more collegial, more welcoming to all students. I am sure that today the environment promotes learning and establishes a sense of professional decorum. If that is the case, then proper office decorum should be easily attainable.

Creating a workplace environment free of sexual harassment for our employees should be what we all strive for.

The key stumbling block in achieving that goal may spring from our tendency to view behavior through our own lens or as a projection of our own intent. If we attempted to extend our understanding to envelop the experience of others on the receiving end of a behavior, we might better understand the transaction that takes place.

In the locker room scenario, most of the men present probably did not intend to demean or hurt members of my gender. Yet, had they been able to empathize with how assaultive the behavior might be perceived, they might have understood the loss of dignity that some of us experienced. They might have refrained from instigating or perpetuating the behavior. They might have even stepped in to reinterpret and model empathy for the targets of the bad behaviors.

For these reasons, I think the sexual harassment prevention training requirements are a positive step. Perhaps the training can move us beyond interpreting our behaviors based solely on our intent or our personal behavioral habits. It may help us understand that harassment is not defined by “a line” that should not be crossed. If training can improve our ability to understand and share the feelings of another, then we might be able to reduce the social and emotional noise that distorts our everyday human interactions at the office. After all, an office that functions with the appropriate professional decorum fosters a personal sense of dignity and well-being in everyone who works there.

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Impressions

Multiple Fee Schedules

David W. Chambers, EdM, MBA, PhD

What a mess! A crown for this patient can be billed at $1,200 because she is highly motivated and fee for service. The same crown for another patient is $820, but the patient is balking at the copay. If the eligibility period is jiggered, the situation might be improved. A Medicaid patient may not have any third-party assistance or personal means of affording badly needed treatment. All of the patients may benefit to the same extent from a crown, and of course the quality of work and attending treatment support must be identical in every case. Surely, there must be an ethical issue here somewhere.

Sometimes we try to solve these problems based on these assumptions: Patients value treatment exactly the same way dentists do and “somebody” is supposed to be providing sufficient funds to keep dentists gainfully employed according to their standards. The polar-opposite position is equally indefensible. Dentistry is not a free-market commodity because patients are not fully informed and uncoerced actors and oral health burdens are borne to some extent by society as a whole.

Here is a true story that may help untangle this. When I was a new faculty member at UOP in 1972, Dean Dr. Dale Redig sent me down to the Stanford Business School to see if we could get a little consulting help. I met with Dr. James March, a paragon in business decision-making. I tentatively inquired about fees and Dr. March quoted what at the time was unthinkable: $700 per hour. He recognized my consternation and gave me a three-minute business lesson that was worth well more than $700. He said he would offer the same advice to General Motors or the Palo Alto YMCA. It would be a bargain for the big car manufacturer and a bad investment for the YMCA. Lesson: The value of any service is determined by the consumer. Dentists are justified in offering their professional services at any price they deem appropriate, provided that it is the same price and quality to all patients. Patients are entitled to make an informed and uncoerced choice about receiving care. Patients will value identical care differently based on their personal values, available subsidies and intangibles such as convenience of appointments (which may add hundreds of dollars to the nominal fee). Third parties, such as employers, the government and charitable causes, are justified in tilting the market in favor of certain groups for social effect by adding money for target groups.

What is not ethical is to cherry-pick patients or mislead them in an effort to “work around” what dentists may regard as insufficient funds for the kind of work they would like to do or to overtreat and overcharge to make things “fair” for them.

The nub:

1. Value of services is determined by patients and payers, not by dentists.
2. Cost of providing acceptable care to all patients is determined by dentists.
3. Dentistry works when the fully informed and uncoerced value to patients and cost to dentists are aligned.

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Identifying Domestic Violence Victims in the Dental Office

Dentists are a key factor in helping patients obtain good oral health, but according to new research, they could also play an important role when it comes to identifying domestic violence victims. A recent paper published in the Journal of Aggression, Maltreatment and Trauma reports that as much as 75% of head and neck trauma associated with domestic violence occurs with oral injury.

The paper was written by researchers at the University of Arizona College of Medicine-Phoenix and Midwestern University, who believe dentists may be the first and only health professionals to evaluate a domestic violence victim.

“The overall purpose of the paper is to bring dentistry and its subspecialties into the conversation about traumatic brain injury (TBI), specifically in cases of domestic violence,” said Midwestern University dental student Timothy Ellis, lead author of the study.

Researchers say an estimated 41.5 million people will experience some type of domestic violence during their lifetime and 20.75 million of those victims will sustain a traumatic brain injury. Signs of violence that may indicate brain injury include jaw or tooth fractures, trauma to nerves in the mouth and jaw as well as damage to the nasal bone. Additional signs that could help dentists potentially identify domestic violence victims include tears, fractures, breaks and chips in the teeth and mouth that are inconsistent with personal history.

While dentists are in the unique position to be the first to detect evidence of assault, they receive little to no education about identifying and discussing domestic violence with potential victims, according to the paper.

“All dentists should be educated on the identification of potential injuries sustained as a result of domestic violence,” said Sheri Brownstein, DMD, co-author of the paper and director of preclinical faculty at the Midwestern University College of Dental Medicine, Arizona. “As health care providers, we are already obligated to report suspected abuse. I do not feel that this will add an undue burden to dentists.”

Researchers continue their study in hopes of helping at least one patient who may be a victim of domestic violence.

Read more on this study in the Journal of Aggression, Maltreatment and Trauma (2019); doi.org/10.1080/10926771.2019.159580.

New Oral Appliance Helps Sleep Apnea

Researchers at Hiroshima University Hospital developed a new oral appliance that is effective at opening the airways of patients with mild to moderate sleep apnea, according to a study published in the journal Sleep Disorders in March 2019.

The new appliance brings the jawbone forward to enlarge the air passageways at the back of the mouth. The appliance is custom made for each patient and allows jaw movement so it doesn’t affect patients’ teeth or change the shape of their face.

“This is like when you have to use glasses, you have to wear them every time you want to see properly so patients have to wear this appliance every time they want to sleep better,” said study author Hiroshi Ueda, PhD.

To further investigate how well the appliance works, the research team scanned a group of patients with mild to moderate sleep apnea using multislice computed tomography (MSCT) — a type of X-ray where the machine rotates around an object and takes a picture each time it rotates. This data is then combined to see a 3D object and is a fast and precise method of scanning.

Previous research usually measured patients standing up, which does not simulate sleeping conditions. This study measured the change in airway space of 13 patients lying flat. The team found that wearing the appliance almost halved the number of times the patients had sleep apnea episodes during the night and widened their airways to allow easier breathing.

Read more of this study in Sleep Disorders (2019); doi.org/10.1155/2019/8509820.

The mandibular advancement appliance. (© 2019 Yu Matsumura et al.)
A new study of twins has found that genetic makeup does not predispose people to tooth decay, but it did find that children with overweight mothers are more likely to have cavities. The paper, published in the latest edition of Pediatrics, estimates that 1 in 3 Australian children have tooth decay by the time they start school.

This was the first twin study that looked at both genetics and early life risk factors such as illness and lifestyle. The study, which followed 173 sets of identical and fraternal twins from pregnancy through age 6, found that 1 in 3 twins had dental decay and almost 1 in 4 had advanced decay.

Researchers also found that genetic makeup does not influence tooth decay, with environmental factors, like a lack of fluoride in water, tending to be a prime cause of cavities. However, the study did show that obesity during pregnancy was a definite marker for increased risk of child tooth decay.

“The relationship between maternal obesity and child tooth decay is complex,” said Mihiri Silva, DDS, lead researcher and pediatric dentist at the Murdoch Children’s Research Institute. “Perhaps the mother’s weight has a biological influence on the developing fetus or perhaps the risk of decay rises because of increased sugar consumption in that household.”

Dr. Silva stressed the seriousness of tooth decay due to the clear link between child cavities and developing diabetes and cardiovascular disease later in life. She also said it was important that tooth decay not be considered genetic.

“If people think the health of their teeth is down to their genetic makeup, they may not be prepared to make important lifestyle changes,” she said. “Our findings reinforce how important it is for pediatricians and other health professionals to educate children to start preventive measures early in life, prior to the onset of damage to dental tissues.”

Read more on this study in Pediatrics (2019); doi:10.1542/peds.2018-3499.

Higher Atherosclerosis Risk for Children With Oral Infections

Children with oral infections may have a higher risk of contracting cardiovascular disease as an adult, according to a study published in JAMA Network Open and conducted by the University of Helsinki Department of Oral and Maxillofacial Diseases in collaboration with the national Cardiovascular Risk in Young Finns study research group.

More progressed oral infections and inflammations such as endodontic lesions and periodontitis are known to be associated with several cardiovascular risk factors and disease risk in adults. Periodontitis in particular has been studied extensively in adults and currently is considered an independent risk factor for atherosclerotic vascular diseases. However, the association between childhood oral infections and atherosclerosis had not been studied prior to the University of Helsinki study, which began in 1980.

That year, researchers documented the number of caries, fillings, bleeding on probing and probing pocket depth of 755 children aged 6, 9 and 12 who underwent oral examinations. Their findings showed that 68% of the 6-year-olds, 87% of the 9-year-olds and 82% of the 12-year-olds had bleeding, caries and fillings with no differences between boys and girls. Slight periodontal pocketing was observed in 54% of the children and it was more frequent in the boys than in the girls. Only 5% of the examined mouths were completely healthy.

Researchers then measured the cardiovascular risk factors of participants several times over the next 27 years. The follow-up ended in 2007 when the carotid artery intima-media thickness of participants was measured through an ultrasound examination. The researchers concluded that viral infections were an independent risk factor for subclinical atherosclerosis and their association with cardiovascular risk factors persevered through the entire follow-up.

Learn more about this study in JAMA Network Open (2019); doi:10.1001/jamanetworkopen.2019.2523.
Drinking Water Linked to Fewer Sugary Drinks and Calories in Kids

Children and teens who drink water are less likely to consume sugary beverages throughout the day, according to a study published in JAMA Pediatrics.

Researchers analyzed data from 8,400 children and teens aged 2 to 19 collected between 2011 and 2016 as part of the National Health and Nutrition Examination Survey, which is administered yearly by the U.S. Centers for Disease Control and Prevention. Parents and kids were asked to recall what the children had consumed in the previous 24 hours and the calories were totaled.

One out of every five kids and young adults reported that they did not drink water in the day prior to the survey. Not drinking water was associated with consuming an extra 93 calories per day on average and 4.5% more calories from sweetened beverages such as sodas, sports drinks and juice, according to the study.

The number of extra calories consumed varied by age as well as race and ethnicity. Caucasian children who didn't drink water got an extra 122 calories from sugary beverages, while Hispanic children consumed an extra 61 calories and African American children an extra 93 calories.

The research was not designed to determine what amount of water would prevent kids from drinking sugary beverages but rather whether drinking water at all had an effect, explained Asher Rosinger, MPH, PhD, assistant professor at Pennsylvania State University and lead author of the study.

Microscopic Robots Remove Dental Plaque

In the age of artificial intelligence, the use of robots has become the new normal. Robots come in the form of automated vacuum cleaners, self-driving cars and soon could be cleaning your teeth.

Conducted by a team of engineers, dentists and biologists from the University of Pennsylvania, a study published in Science Robotics details a microscopic robotic cleaning crew designed to destroy harmful bacteria. The researchers believe the robotic system serves many purposes from reducing the risk of tooth decay and endodontic infections to cleaning water pipes and catheters, which are also common areas for bacteria to form.

The research team designed two types of robotic systems, which they called catalytic antimicrobial robots or CARs. The robots are capable of breaking down and removing biofilms on surfaces and inside confined spaces. Tested on flat glass surfaces and enclosed glass tubes, the microscopic robots effectively killed bacteria, broke down the surrounding matrix and removed debris with high precision.

Researchers then tested the systems on hard to reach parts of a human tooth. The CARs were able to not only degrade and remove bacterial biofilms from a tooth surface, but also from the isthmus, the narrow corridor between root canals where biofilms commonly grow.

“Existing treatments for biofilms are ineffective because they are incapable of simultaneously degrading the protective matrix, killing the embedded bacteria and physically removing the biodegraded products,” said Hyun (Michel) Koo, DDS, co-author of the study and professor in the School of Dental Medicine, University of Pennsylvania. “These robots can do all three at once very effectively, leaving no trace of biofilm whatsoever.”

Researchers say plowing away the degraded remains of the biofilm substantially decreases the chance of it regrowing.

Learn more about this study in Science Robotics (2019); doi:10.1126/scirobotics.aaw2388.

With the limitations in mind, the research team stressed that sugar-sweetened beverages add empty calories to children's diets and may increase the risk of weight gain, obesity and diabetes. Kids who don’t drink water are more likely to get their fluids elsewhere and all it takes is an extra 70 calories or so per day for a child to gain excess weight and be at risk for overweight or obesity, according to the study.

Learn more about this study in JAMA Pediatrics (2019); doi:10.1001/jamapediatrics.2019.0693.
Study Explains How a Pathogen Causes Hospital Infections

Researchers discovered that three closely related species of bacteria belonging to the family Enterobacteriaceae outlived all other oral bacteria in long-term starvation or a “doomsday” experiment, according to a paper published in the Proceedings of the National Academy of Sciences. These results helped answer the question of how certain dangerous bacteria are able to persist in a sterile hospital environment and infect patients.

“From a big picture point of view, this is a huge step forward toward understanding microbial social structure and ecology,” said Wenyuan Shi, PhD, CEO and chief scientific officer at the Forsyth Institute. Researchers from the Forsyth Institute, the J. Craig Venter Institute, the University of Washington and the University of California, Los Angeles led the study.

To create a battle of bacteria, the research team placed hundreds of samples of oral bacteria from human saliva into test tubes. The bacteria, which are accustomed to living in the nutrient-rich mouth, were starved in their new environment. Each day, scientists checked the samples to see which bacteria were still alive.

Nearly every bacterial species died within the first couple of days, according to the study. But three species — Klebsiella pneumoniae, Klebsiella oxytoca and Providencia alcalifaciens — survived the longest, with Klebsiella pneumoniae and Klebsiella oxytoca surviving for more than 100 days.

Researchers were surprised to find that Klebsiella were among the champions of this bacterial combat. In their natural environment of the oral cavity, Klebsiella are considered an underdog. They account for only about 0.1% of all microbes in the mouth. But in an extreme environment deprived of all nutrients, Klebsiella reigned supreme while the bugs normally found in high abundance rapidly died off.

How did Klebsiella pull off such a feat? To answer this question, scientists analyzed the genome of the bacteria on the first day of “battle” and then again on day 100. The researchers found that the Klebsiella had undergone genetic mutations that may have allowed them to survive and continue to function, even without a food source.

Read more of this study in Proceedings of the National Academy of Sciences (2019); doi.org/10.1073/pnas.1820594116.

Biodegradable Chewing Gum Kills Bacteria, Removes and Prevents Plaque

Emily Siegel, a University of Pittsburgh senior majoring in chemical engineering and biological sciences, invented a biodegradable chewing gum that kills bacteria and removes and prevents plaque. The gum, called Trek, was developed for an assignment in a product design class that challenged students to think of a problem and come up with a product to solve it. The memory of multiple late nights when she was too tired to even brush her teeth sparked Siegel’s idea.

Trek took the top prize in the most recent Big Idea Blitz, a 24-hour event in which student innovators recruit fellow students to their teams and work with Innovation Institute entrepreneurs-in-residence to develop their ideas, understand the market need and hone their pitches. Siegel’s winning pitch cited a study by Delta Dental that found that 37% of adults aged 18 to 24 had gone two or more days without brushing their teeth.

Not only does Trek remove and prevent plaque, it’s also better for the environment because it creates no plastic waste, unlike disposable single-use toothbrushes, and is 100% biodegradable.

Siegel envisions that this product not only will benefit busy millennials, but also will appeal to travelers, members of the military and people in places where clean water is difficult to come by. Trek’s prize money is going toward further development of this idea around which Siegel intends to create a company and an entrepreneurial career.

Read more about Trek and the Big Idea Blitz at pittwire.pitt.edu/news/those-too-tired-brush.

Lauren Yocum and Emily Siegel won the 2019 Randall Family Big Idea grand prize. (Credit: Tom Altany/ University of Pittsburgh)
This and an upcoming issue of the Journal of the California Dental Association are about a subject that most of us spend little to no time thinking about: safety. I began writing this and thinking about safety more than four years ago while sitting on an airplane traveling nearly 600 mph at 34,000 feet. At the time, I hoped that someone took safety seriously when the plane was being designed, built, flight tested and delivered and before takeoff with the preflight maintenance and walk-around of the plane on the ground. We rarely think about the other aspects of flight safety involving the control tower and air traffic controllers, the acceleration of the plane, the impact of the tires on the runway or the takeoff and flight. As the plane hurtles through the sky, ground control is plotting a safe route avoiding collisions. In the air, the pilot and co-pilot are checking and rechecking the instruments, monitoring the operating functions of the plane as the flight crew monitors the safety of the passengers.

Our day in the dental office is not much different but we don’t quite realize it; we tend not to spend much time thinking about the safety of our dental environment. When most people think about safety, we remember a kid from elementary school with a yellow Sam Browne belt escorting us across the street — a member of the “safety patrol” helping us safely navigate the dangerous crossings. We, as practitioners, have to make the dental environment safe for our patients, our staff and ourselves. And though the news media has had lots to write about lately concerning behavior management, anesthesia and sedation in children, safety is also about dental materials, procedures, medication errors and ergonomics. It’s about everything we do during our days in the office.

Doing it “like the airlines do it” has always been a safety catchphrase and the apex of safety training with checklists, safety checks and walk-arounds, but recently there have been chinks in the airlines’ armor. The Boeing 737 Max debacle is a prime example of trying to patch an...
old system: not training pilots in a known flaw and neglecting to put a monitoring light in the cockpit when the new system goes against all prior training activities. This violates every part of safety culture and undermines and erodes the trust that the public puts in the airlines industry.

We have similar issues in dentistry and medicine, but dentistry is not the only health care related business or profession dealing with this. The American Association for Accreditation of Ambulatory Surgical Facilities for ambulatory surgical facilities and the Joint Commission for Accreditation of Hospital Organizations for hospitals set requirements and certify facilities in all areas of the delivery of health care. Our dental offices are little hospitals with reception, billing, central sterilization, human resources, radiology, operating rooms, equipment and maintenance, IT and other support services, auxiliary staff and building and grounds workers. We are mini surgicenters and as such are regulated and permitted by local and state boards and federal mandates including OSHA and HIPAA. We can learn lessons from these other organizations in setting up and following a culture of safety. The simplest concepts of “time outs” to verify the patient and procedure and written checklists to make sure we are fully prepared are key not just for advanced procedures of sedation and anesthesia but for our daily routines (a variety of customizable safety checklists are available at adsahome.org). Training and practice must be maintained with records kept. The costs of not practicing safely are very high.

Although dentistry is at a bit of a disadvantage, being an office-based specialty with limited internal quality assurance, we can learn from the best practices in medicine and make them available to our member dentists. To help you develop a safer dental practice, the authors of this issue of the Journal are nationally and internationally known experts in their fields of safety and dental education. ElsBeth Kalenderian, DDS, MPH, PhD, and co-authors provide an introduction and overview to safety and the tools needed in the dental office. Oluwabunmi Tokede, DDS, MPH, demonstrates the use of checklists to organize and improve flow and function, much like pilots do prior to takeoff. Steven Barrabee, Esq., an attorney who frequently works with dentists through The Dentists Insurance Company, discusses the actual costs of not practicing safely. Mark Donaldson, BSP, ACPR, PharmD, and Jason Goodchild, DMD, discuss the use of medications in emergency treatment and provide an understanding of how and why they work.

This Journal issue and the one following will start you on your path to developing a safety program in your office through an understanding of the many complexities of the situation. Because while it may not be exciting, safety sure is necessary — in the air and in the dental chair.
Health care professionals strive to provide care that adheres to the highest standards of safety, but unfortunately harm to patients continues to be an obstacle during the administration of clinical treatment. Harm as a result of both individual and systemwide errors is common in the provision of dental care. Evidence from case reports in the literature as well as an analysis of data from the U.S. Food and Drug Administration Manufacturer and User Facility Device Experience database reports that adverse events (AEs) occur with regularity within the dental office. Medicine has put forth a multifaceted approach to address patient safety through the formulation of methods that focus on systemwide improvements rather than punitive measures toward individuals. The concerted effort has produced less personal censure of health care practitioners, increased the appetite for redesigning systems within health care delivery, expanded the commitment to transparency and ushered reevaluations of organizational cultures.

Defining Patient Safety for Dentistry
There are several definitions of patient safety that attempt to outline the topic's parameters as evidenced by the study conducted by Bailey et al. The Institute of Medicine (IOM) defined patient safety in 2000 to be: “The prevention of harm to patients.” Vincent in 2006 defined it to be: “The avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of health care.” The World Health Organization (WHO) in 2011 defined it as: “The reduction of risk of unnecessary harm associated with health care to an acceptable minimum.” The National Advisory Group on the Safety of Patients in England in 2013 defined...
it as: “Avoiding harm from the care that is intended to help.” At their core, the common themes that permeate each definition are the prevention, reduction and/or mitigation of harms to patients as a result of provider treatment. Patient safety has spurred considerable national investment from both governmental and independent entities like the reports from the U.S. Department of Health and Human Services (The National Healthcare Quality and Disparities Report and Healthy People 2010, 2020) and the National Academy of Medicine. Each has listed patient safety as a distinct public health priority.

As a point of action in 2002, the Agency for Healthcare Research and Quality (AHRQ) proposed a four-element patient safety initiative in an effort to curb treatment-related harms. This model was used as a framework to identify and reduce the risk of harms associated with medical errors and health care system-related issues. The model consists of four elements:

- **Element 1:** Identify threats to patient safety through rigorous chart reviews and assessing the organizational patient safety cultures using the Medical Office Survey on Patient Safety Culture (MOSOPS).
- **Element 2:** Identify and evaluate effective patient safety practices using root-cause analysis and health care failure mode and effect analysis (HFMEA).
- **Element 3:** Educate, disseminate, implement and raise awareness.
- **Element 4:** Monitor threats to patient safety to ensure that a safe environment continues.

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**Strategies To Assess Patient Safety Culture**

Thorough and comprehensive methods are required to assess patient safety within a health organization regardless of its size. This includes the systemwide engagement of company leadership, the evaluation of existing safety cultures, the advancement of education to enhance communication and the development of reporting systems. High-reliability health care organizations are characterized by effective communication and shared values for promoting a culture of safety.

To initiate engagement, encourage data collection and facilitate reporting, medicine has developed several instruments intended to measure an institution’s safety culture, each consisting of items measuring the safety values of health care providers. The Patient Safety Cultures in Healthcare Organization (PSCHO), the Hospital Survey on Patient Safety (HSOPS) and the Safety Attitudes Questionnaire (SAQ) are validated instruments with common dimensions and comparative inference capabilities. Versions of each survey have been used to measure the safety culture among nurses, physicians and administrative staff in a variety of delivery settings (hospitals, clinics, inpatient and outpatient).

AHRQ has developed instruments for an array of clinical settings that have been used to gauge an organization’s safety climate, some of which have been adapted for dentistry. Notably, the MOSOPS instrument, which was tailored to single specialty and primary care clinics in the outpatient setting, was most aligned to the dental arena. In 2008, Leong et al. sought to assess the safety culture among providers at seven U.S. dental schools using the MOSOPS and the results were then compared with those from a similar study conducted in 20 U.S. hospitals in the Midwest. Leong found that the seven dental schools outperformed the 20 hospitals on overall perceptions of safety, management support for patient safety and teamwork across units. Furthermore, the dental schools also scored higher than their medical counterparts for the overall score from the 12 sections of the survey. In 2014, Ramoni et al. assessed the safety culture within the dental office by enlisting the use of the MOSOPS as well. The MOSOPS was administered to providers in three U.S. dental institutions comparing the results to those of an aggregated national sample of approximately 1,100 medical offices. The study concluded that there was room for significant improvement in the patient safety culture of dentistry, particularly...
The most frequently seen AE types were reported injuries and reported device malfunctions. To continue AE identification (Element 1 in FIGURE 1), Obadan-Udoh et al. in 2015 sought to report on dental adverse events through a retrospective review of case reports found in electronic bibliographic databases. The investigators found 182 publications containing 270 adverse event cases. The largest types of harm reported were delayed and unnecessary treatments or disease progression after misdiagnoses. Among the reviewed cases, nearly 1 in 4 patients experienced a permanent harm adverse event and approximately 1 in 10 case reports reviewed (11.1%) reported that the adverse event resulted in the death of the affected patient. The study concluded that although case reports are a rich data source for adverse events, they represent an incomplete account of the potential threats to patients.

In addition to the database searches, case reports and incident reports given by providers, each of which has its own shortcomings, the use of the electronic health record (EHR) for retrospective or concurrent chart review is a significant resource in identifying adverse events. Investigators can select and review random charts from the EHR to pinpoint adverse events within their respective practices.

Strategies To Identify Dental-Related Harms

High-functioning patient safety cultures are associated with improved general safety metrics, increases in adverse event reporting and decreases in adverse events and errors. To continue these trends, stakeholders must work to align the organization’s safety culture vision with the training of all dental providers. This involves analyses of provider descriptions of adverse events and how knowledge is transferred to colleagues and the public. A study conducted by Maramaldi et al. contributed to the dental patient safety initiative by developing an inventory of AEs generated by interviewing dental providers. The authors interviewed dental professionals and domain experts through focus groups where they were asked to identify the types and causes of AEs and recommend classifications for those that could occur in dental settings. AEs were defined as: “Harm caused to the patient by dental care, regardless of whether it is associated with an error or is considered preventable.” Causes were defined as: “Factors that may lead to harm and not the harm itself.” The authors identified 747 unique AEs and 540 causes. The three most frequently identified AE types were “wrong-site, wrong-procedure (WSPE)” at 16%, “hard tissue damage” at 15% and “soft tissue injury” at 13% (FIGURE 2). The three most frequently reported causes were rule-based errors (43%), skill-based active errors (22%) and knowledge-based active errors (13%) (FIGURE 3). The Food and Drug Administration Manufacturer and User Facility Device Experience (MAUDE) database is another approach used to determine the distribution and type of AEs associated with dental devices. The MAUDE database contains reports from health care providers, consumers, manufacturers and user facilities. Manufacturers and distributors are required to report device-related AEs to the FDA within 30 days. A study conducted by Hebballi et al. in 2015 downloaded and reviewed the dental device-related AEs reported to MAUDE over a 15-year period. MAUDE received a total of 1,978,056 reports during the study period and among these reports 28,046 (1.4%) were associated with dental devices. Most frequently seen AE types were reported injuries and reported device malfunctions. To continue AE identification (Element 1 in FIGURE 1), Obadan-Udoh et al. in 2015 sought to report on dental adverse events through a retrospective review of case reports found in electronic bibliographic databases. The investigators found 182 publications containing 270 adverse event cases. The largest types of harm reported were delayed and unnecessary treatments or disease progression after misdiagnoses. Among the reviewed cases, nearly 1 in 4 patients experienced a permanent harm adverse event and approximately 1 in 10 case reports reviewed (11.1%) reported that the adverse event resulted in the death of the affected patient. The study concluded that although case reports are a rich data source for adverse events, they represent an incomplete account of the potential threats to patients.
Medicine has used random chart reviews for adverse event reporting (adverse event rate of 3% to 4%) but this method has been shown to be inefficient because it requires considerable resources to audit the large number of records. A more focused approach to adverse event detection in the EHR has been the “trigger” method. Each trigger is defined by a prespecified set of keywords found within the dental charts/records and acts as clues to help providers identify harmful incidents.

The concept of a trigger (or clue) to identify adverse events in the medical record was introduced by Hershel Jick in 1974 but was later automated and refined for use with the electronic medical record. The Institute for Healthcare Improvement (IHI) used triggers with manual record reviews in 1999 to identify adverse medication events, and adaptations of the methodology for other areas of the hospital followed. More recently in 2013, Kalenderian et al. created a dental clinic trigger tool to compare its AE detection performance with that of a review of randomly selected patient records. In total, 315 records were triggered, 158 (50%) of which were positive for one or more AEs while 17 (34%) of the 50 randomly selected records were positive for at least one AE. Most AEs were classified as causing temporary harm. In 2018, Kalenderian et al. continued this work by refining the triggers within the EHR and implementing them within four academic dental institutions. Eleven EHR-based triggers were developed and tested for efficiency in adverse event identification. In order to validate each trigger, an iterative consensus-based process was employed. Two calibrated dental raters independently reviewed a sample of the triggered charts to determine AE status and subsequent classification. To provide an additional degree of review, an expert panel reexamined the charts. A total of 100 AEs was identified by 10 of the 11 triggers. Pain was the most common AE identified, followed by infection and hard tissue damage. As a quality improvement strategy, pain was reported and classified as an adverse event. Chorney et al. have argued that treating pain as an adverse event places accountability for patient pain management in the hands of the providers, requiring them to perform standard care with minimum pain and report instances when pain management failed. The best performing triggers were those developed to identify infections, allergies and failed implants, and most AEs (90%) were categorized as temporary, moderate to severe harm. Each of these studies showed that the dental clinic EHR-based trigger approaches were more effective in AE detection than manual audit of random charts (TABLE).

### Future Directions

Although dentistry has made progress in patient safety initiatives, there are still considerable gaps to fill. In order to fully achieve the goals set forth in Element 2 of the AHRQ model initiative, efforts should be made to identify the causes of harm that occur within the dental office so that evidence-based safety practices can be implemented. There are several analytical approaches that could be utilized to help a dental organization establish a stable safety footprint. The Continuous Quality Improvement (CQI) strategies, the Total Quality Management frameworks and the Institute for Health Improvement (IHI) model describe methods that repeatedly assess an organization’s current state and measures to advance the safety objectives.

The analytical approach used in medicine to ascertain the underlying determinants of dental-related harms is root cause analysis (RCA). The method’s purpose is to identify the source factors responsible for the adverse events and provide solutions. RCA focuses on

### TABLE

<table>
<thead>
<tr>
<th>Adverse Event Categories</th>
<th>AE Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>57</td>
</tr>
<tr>
<td>Infection</td>
<td>16</td>
</tr>
<tr>
<td>Hard tissue damage</td>
<td>11</td>
</tr>
<tr>
<td>Nerve injury</td>
<td>12</td>
</tr>
<tr>
<td>Soft tissue injury/inflammation</td>
<td>5</td>
</tr>
<tr>
<td>Other orofacial harm</td>
<td>2</td>
</tr>
<tr>
<td>Allergy/toxicity/foreign body response</td>
<td>1</td>
</tr>
<tr>
<td>Aspiration/ingestion of foreign body</td>
<td>1</td>
</tr>
<tr>
<td>Other systemic harm</td>
<td>0</td>
</tr>
<tr>
<td>WSPEs (wrong-site, wrong-procedure and wrong-patient errors)</td>
<td>0</td>
</tr>
<tr>
<td>Bleeding</td>
<td>0</td>
</tr>
<tr>
<td>Other harm</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

**FIGURE 3.** Breakdown of causes.
reviewing dental charts with observed AEs where providers are required to evaluate any deviations from the expected line of care.

The IHI model for improvement is another analytical approach used to strengthen patient safety practices. Within the IHI model, there are three introductory questions to be answered:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What change can we make that will result in an improvement?17

These questions are derived from the Plan-Do-Study-Act (PDSA) cycle, an iterative procedure used by health care providers to map out their quality improvement objectives, how to measure them and which measures would be most effective in assessing whether a change has been observed.17 Incorporating any of these improvement approaches will help to instill consistent refinement of safety ideas while improving health care delivery for patients.17

Conclusion

While patient safety in dentistry has received increased consideration in recent years and moderate steps have been taken to improve safety networks, critical deficits still exist. Dentistry must work beyond culture measurement and adverse event reporting to understanding the root causes of dental care-related harms and complete acceptance/implementation of improvement models. ■

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Checklists as Tools for Improving Patient Safety in Dentistry

Oluwabunmi Tokede, DDS, MPH, and Elsbeth Kalenderian, DDS, MPH, PhD

ABSTRACT Safety is not a permanent state of affairs — we relentlessly need to work at it. A health care system truly focused on health demands continuous attention to patient safety. Against this backdrop, checklists emerged as practical and effective tools for realizing a safer health care environment.

Safety is not a permanent state of affairs — we relentlessly need to work at it. A health care system truly focused on health demands continuous attention to patient safety. Though the concern for not harming patients has been a fundamental factor in health care since it first began, the 1999 publication of To Err Is Human: Building a Safer Health System by the Committee on Quality of Health Care in America of the Institute of Medicine, catalyzed a patient safety and quality improvement revolution in medicine.

Dentistry has been slow to embrace this patient safety revolution. There are only a few structured or well-studied data regarding patient safety or adverse events in dentistry. The existing body of literature describes isolated clinical cases or short series on the basis of which empirical clinical recommendations are made. Dentistry, however, must become more involved in issues that pertain to patient safety. A study reported that the amount of resultant costs of revision procedures and services required to repair iatrogenic harm have been estimated at 17,757 euros per accident. The average dental claim is reported to range from $30,000 to $50,000.

Although the sentiment is starting to change, with more focus on defective systems rather than flawed people, there is still the pervasiveness of a culture that makes it difficult for medical or dental professionals to admit that errors can be made. This refusal to acknowledge that we make (and will continue to make) errors compromises patient safety. A study documented that dental practitioners make on average two errors per day and 1.4% of these errors lead to an adverse event where the patient could potentially be harmed. The safest systems do not rely upon the practitioner to avoid making errors, but have a series of safety barriers that prevent errors from occurring. The dental community needs to invest in the creation of a more effective environment for the application of knowledge to health care provision and delivery. Published studies affirm the need for tools that will help us consistently meet well-accepted clinical guidelines and principles.
Checklists and Their Use in Medicine

Against this backdrop, checklists emerged as practical and effective tools for realizing a safer health care environment. Checklists have since transformed medicine, as they did aviation and engineering. They function as support resources by sorting items as a list—a format that simplifies understanding and recall of information. From the earlier days when a surgery and intensive care unit (ICU) team was guided through the entire process of saving a girl who was lost beneath an icy pond for 30 minutes in a small Austrian suburb to how in 2006 they helped (via the Keystone initiative) to reduce the quarterly infection rate of central lines to zero, saving an estimated $175 million and more than 1,500 lives in 18 months, checklists have proven to be effective at improving safety and preventing errors. Consequently, the World Health Organization (WHO) in 2009 engineered a “safe surgery” checklist and applied it around the world with staggering success. Checklists now exist throughout medicine and are increasingly being used to reduce occurrence of errors of omission, create reliable evaluations and, most pertinently, improve quality and use of best practices.

Checklists are used as cognitive aids to guide users through accurate task completion. Checklists generally outline criteria to be considered for a particular process. They function as a support resource by delineating and categorizing items as a list—a format that simplifies conceptualization and recall of information. The use of checklists is founded on the principle that human error is inevitable and checklists have proven to be effective in various aspects of performance improvement and error prevention and management. High-intensity disciplines such as the airline industry and the military broadly employ checklists to decrease errors of omission and improper implementation of procedures and protocols and to decrease human error under stressful conditions.

Checklist Use in Dentistry

In dentistry, there have been isolated cases of checklist use in the diagnostic workup of dental patients accepted for aesthetic dental treatment; in dental implantology to aid in minimizing risk and increasing implant success rates, especially for inexperienced practitioners; in endodontics for standardizing endodontic procedures; in surgery for preventing wrong-site surgery/wrong-tooth extractions; in oral radiography to help improve the quality of radiographic exposures, thereby impacting patient safety by limiting unnecessary exposure to radiation; and in prosthodontics to improve clinic-laboratory communication. Nevertheless, checklists are not commonplace in dentistry.

Characteristics and Types of Checklists

A checklist is a list of action items, tasks or behaviors arranged in a consistent manner that allows the evaluator to record the presence or absence of the individual items listed. Typically, each item is checked off as it is completed, verified, identified or answered by placing a mark in a designated space. A sound checklist highlights the essential criteria that should be considered in a particular area. There are many different types of checklists. Examples include task lists, troubleshooting lists, coordination lists and to-do lists, each useful in different situations. In terms of timing of use, checklists can either be read-do or do-confirm. In the former, people carry out the tasks as they check them off. For the latter, team members perform their jobs from memory and experience, often separately, but then pause at predetermined
1. **Focus the checklist task**
   - Define the content area of interest.
   - Define the checklist’s intended uses.
   - Reflect on and draw upon pertinent training and experience.
   - Study the relevant literature.
   - Engage and have conversations with experts in the content area.
   - Clarify and justify the criteria to be met by the checklist (e.g., pertinence, comprehensiveness, clarity, concreteness, ease of use, parsimony, applicability to the full range of intended uses and fairness).

2. **Make a candidate list of checkpoints**
   - List descriptors for well-established criteria of merit.
   - Briefly define each of the initial checkpoints.
   - Add descriptors for checkpoints needed to round out a definition of merit for the content area.
   - Provide definitions for each of the added descriptors.

3. **Classify and sort checkpoints**
   - Write each descriptor and definition on a separate 4-inch by 6-inch card.
   - Sort the cards in search of categories.
   - Identify the main candidate categories and label each category.

4. **Define and flesh out categories**
   - Define each category and its key concepts and terms.
   - Write a rationale for each category.
   - Present relevant warnings about being overzealous in applying the checkpoint.
   - Review the checkpoints in each category for inclusiveness, clarity and parsimony.
   - Add, subtract and rewrite checkpoints as appropriate.

5. **Determine order of categories**
   - Decide if order is an important consideration regarding the intended uses of the checklist.
   - If so, write a rationale for the preferred order.
   - Provide an ordering of the categories.

6. **Obtain initial reviews of checklist**
   - Prepare a review version of the checklist.
   - Engage potential users to review and critique the checklist.
   - Interview the critics to gain an in-depth understanding of their concerns and suggestions.
   - List the issues in need of attention.

7. **Revise checklist content**
   - Examine and decide how to address the identified issues.
   - Rewrite the checklist content.

8. **Delineate and format the checklist to serve the intended uses**
   - Determine with potential users whether category and/or total scores are needed or desired.
   - Determine with users what needs exist regarding differential weighting of categories and/or individual checkpoints.
   - Determine with users any checkpoints or categories of checkpoints that must be passed for a satisfactory score on the overall checklist.
   - Determine with users what needs exist regarding profiling of checklist results.
   - Format the checklist based on the above determinations.

9. **Evaluate the checklist**
   - Obtain reviews of the checklist from intended users and relevant experts.
   - Engage intended users to field test the checklist.
   - Generally, assess whether the checklist meets the requirements of pertinence, comprehensiveness, clarity, applicability to the full range of intended uses, concreteness, parsimony, ease of use, and fairness.

10. **Finalize the checklist**
    - Systematically consider and address the review and field test findings.
    - Print the finalized checklist.

11. **Apply and disseminate the checklist**
    - Apply the checklist to its intended use.
    - Make the checklist available via such means as journals, professional papers, web pages, etc.
    - Invite users to provide feedback to the developer.

12. **Periodically review and revise the checklist**
    - Use all available feedback to review and improve the checklist at appropriate intervals.
intervals to run the checklist and confirm that everything that was supposed to be done was done. Checklists are different from algorithms, care maps and protocols and educational tools; therefore, they are not useful in all situations. Good checklists are precise, efficient, to the point and easy to use even in difficult situations. They do not try to spell out everything, rather they provide reminders of only the most critical and important steps — the ones that even the highly skilled professionals using them could miss. Good checklists are, above all, practical.

Developing and Validating a Checklist
The early stages of the development of the checklist should center on content (FIGURE 1). The goal of the checklist will ultimately define its content. Content can be obtained from literature sources (peer-reviewed guidelines, consensus of experts in the domain or stipulations by dental governing bodies) and/or professional experience. This will generate an all-inclusive list of items for the evolving checklist. The next steps are to:

- Define the context of the checklist — checklist protocols that are prospectively tailored to the context in which they are to be used are more likely to be used and sustained in practice.
- Define the checklist’s intended uses.
- Clarify the criteria to be met by the checklist.
- Validate the checklist.

Validation of the checklist should take the form of a critical feedback survey. Participants should be asked to assess the checklist using closed- and open-ended questions that are based on Stufflebeam’s evaluation criteria (constructs) including applicability to the full range of intended uses, clarity, comprehensiveness, ease of use, fairness, parsimony and pertinence (FIGURE 1). Each closed-ended question should utilize an interval-response format from strongly disagree to strongly agree. For the open-ended questions, participants must be encouraged to write directly on the checklist answering four questions, one each focusing on its strengths, the areas that need improvement, items that are missing and those that appear as confusing. The data from the closed-ended questions should be summarized using descriptive statistics while qualitative data should be analyzed using Hsieh and Shannon’s summative content analysis.

For this qualitative data analysis, recording units of analysis should be categorized into the same criteria that served as the basis for the closed-ended questions so that responses can be compared.

A detailed stepwise list of potential considerations during checklist development is shown in FIGURE 2.

Implementing a Checklist
Beyond content, the other critical factor in the success of a checklist is its implementation. The science of implementation involves the study of methods that promote the systematic uptake of scientific evidence into routine practice and thereby help to improve the safety, quality and effectiveness of health services and care. The gap between developing and identifying evidence-based best practices and improved quality of care is bridged by proper implementation. FIGURE 3 shows a sample implementation scheme with an execution and an evaluation arm.

As depicted in FIGURE 3, the initial execution stage (A) will involve obtaining endorsements from clinical champions, vigorous advertising and education of all the would-be users. This education/training campaign will include a demonstration/hands-on training for every relevant subgroup and include:

- Evidence of checklist success in other similar aspects of health care delivery.
- The development process and main concepts of the checklist.
- The checklist’s modality of use within the clinics.
Following training, the checklist should be implemented (stage B) within the clinics. After implementation, there needs to be a continuous mechanism whereby questions, feedback and comments (stages C and D) can be directed to the checklist team for consideration and necessary modification (stage E).

Regarding evaluation, the checklist development team should assess:

- The utilization of the checklist within the clinic.
- The effect of checklist use on the predetermined/desired outcome.

Final Considerations

Checklists are malleable. As such, it is difficult to anticipate every clinical situation in which they would be appropriate or useful. In dentistry, however, they can potentially be used by all subspecialties for varying purposes as standardizing processes, preventing errors, enhancing recall, facilitating communication, etc. The authors are currently evaluating the impact of implementing a five-list e-checklist on the completeness of clinical record-keeping. As indicated earlier, checklists do not try to spell out everything; rather, they provide reminders of only the most critical and important steps — the ones that even the highly skilled professionals using them could miss. Therefore, they are very context-specific. Potential adopters of checklists need to evaluate their system and identify the specific point at which the checklist intervention would be useful. Also, inasmuch as we have outlined specific steps in the development and implementation of checklists, these are mainly guidelines and not protocols. Smaller institutions/practices can adopt much simpler, abridged steps.

The mere existence of a policy and checklist does not ensure patient safety. To be clinically effective, there needs to be a strong, committed leadership to patient safety, standardization of processes, cross-checks, monitoring and measuring compliance, sharing lessons from incidents, reviewing processes, educating and empowering team members, measuring effective team communication and feedback from frontline staff. The sustained use of checklists is more likely to occur when staff are actively engaged. Involving clinicians in tailoring the checklist to better fit the context of the practice and giving them the opportunity to reflect and evaluate the implementation intervention enables greater participation and ownership of the process.

Although the implementation of checklists has not always directly correlated with significant improvements in patient care and decreases in human error, no published data to date indicate that checklists have contributed to adverse events, such as imposing a burden on the primary care providers, delays in treatment because of lengthy checklists or errors of omission. Rather, they are largely considered important tools to condense large quantities of knowledge in a concise fashion, reduce the frequency of errors of omission, create reliable and reproducible evaluations and improve quality standards and use of best practices. There are, however, instances in which excessive use of checklists could become a hindrance in the health care setting. If each detail of every task were targeted for the development of a checklist, clinicians may experience “checklist fatigue,” whereby they become overburdened with completing these lists. Rather than fulfilling its role as a support resource and error management tool, a checklist could begin to unnecessarily complicate processes and decrease reliability by adding a secondary layer of complexity. To suggest strict adherence to checklists in all situations is impractical and to do so could compromise the efficacy of a clinical process or procedure and risk infringing on efficient clinical judgment. Careful selection of checklist topics and consideration of clinical judgement in the content design process can help avoid these potential downfalls. Being realistic in implementation means focusing on what can be done and setting aside what may seem desirable but not feasible.

In conclusion, “... all learned occupations have a definition of professionalism, a code of conduct. It is where they spell out their ideas and duties — ours include beneficence, patient autonomy, veracity, justice and most pertinently, nonmaleficence. “These codes are sometimes stated, sometimes just understood. But they all have at least three common elements. First is an expectation of selflessness — that we (dentists, lawyers or soldiers, etc.) will place the needs and concerns of those who depend on us above our own. Second is an expectation of skill/competence — that we will aim for excellence in our knowledge and expertise. Third is an expectation of trustworthiness — that we will be responsible in our personal behavior toward our charges. Aviators, however, add a fourth expectation: Discipline — discipline in following prudent procedure in functioning with others.” That is a critical component to why flying remains the safest way to travel. Discipline is hard. We have to work at it. The consistent use of a checklist requires discipline.
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The Cost of Not Practicing Safely: Perspectives in the Legal Profession

Steven Barrabee, Esq.

**Abstract** The unsafe practice of dentistry can cause injuries to patients, employees or the general public that can adversely affect a dentist’s ability to practice. Violations of administrative rules can result in monetary penalties. Violations of safety regulations, willful misconduct or negligence can result in lawsuits by government prosecutors or injured parties. The dental board may sanction dentists for violation of safety ordinances. This article elucidates the legal ramifications of the unsafe practice of dentistry.

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Conflict of Interest Disclosure: None reported.

We often hear from our colleagues and clients that it’s impossible to operate a dental practice in California. This, it is believed, is due to the myriad regulatory requirements and the risk of malpractice lawsuits that require the practice of defensive dentistry. This perspective is often based on the belief that safety regulations place an unnecessary burden on a practice and the cost of compliance far outweighs the risk for which the standards were enacted. Regulatory safety standards were enacted to prevent recurrent, preventable injuries. Liability for dental malpractice arises from an injured person’s belief, proved through evidence presented by a member of the dental profession, that the treating dentist acted in an unreasonable manner to cause their injury. The Dental Board of California was established with the overarching requirement to protect the public by exercising its licensing, regulatory and disciplinary functions.\(^1\) Legal liability in the form of administrative penalties, tort liability, sanctions against dental license and, in rare circumstances, criminal liability are the enforcement mechanisms used to ensure compliance with safety standards. The reason dentists fail to comply with safety regulations range from ignorance of the law, costs savings and long-term custom and habit in the way they have always practiced. This article highlights the significant legal ramifications of practicing unsafely.
Federal and State Statutes, Rules and Regulations Governing the Practice of Dentistry

The most obvious rules governing safety in the dental practice are the worker safety rules established by state and federal administrative agencies. Safe-workplace rules and regulations are imposed through state and federal Occupational Safety and Health Administration (OSHA) rules, rules governing the prescription of medications (CURES 2.0) and health and safety code provisions.

The most pervasive safety rules governing the dental office are contained in Cal/OSHA and federal OSHA rules and regulations. Cal/OSHA and OSHA rules are designed to protect employees from workplace injuries. While OSHA rules are designed to protect employees as a corollary, they affect how patient care is provided. OSHA rules have been developed to limit the spread of bloodborne pathogens, handling of and communication concerning the use of hazardous substances, the use of nitrous oxide and the use of formaldehyde.

OSHA provisions for bloodborne pathogens require universal infection control including the creation of written exposure-control plans updated annually, the use of universal infection-control precautions, consideration and use of safer needles and sharps, the use of masks, gloves and protective clothing, proper use and disposal of sharps and proper handling of blood or other potentially infectious materials. Further requirements include proper cleaning and decontamination of the worksite, employee hygiene and vaccination to protect employees from hepatitis B.

The use of hazardous chemicals in the workplace to which employees may be exposed creates an obligation to create a written hazard-communication plan, creation of a list of hazardous chemicals used and stored, maintenance of material safety data sheets for each chemical and employee training.

The presence of radiation (X-ray equipment) requires the adoption of a plan and implementation of a program to achieve occupational doses and doses to members of the public that are as low as reasonably achievable. These include restricted areas to limit employee exposure, duty to wear personal radiation disclosure devices and proper labeling of rooms.

The law requires some form of inspection of dental equipment every five years.

OSHA violations can not only harm employees and/or patients, but also can result in significant administrative penalties.

Violation of Cal/OSHA rules can not only harm employees and/or patients, but also can result in significant administrative penalties. Cal/OSHA violations vary depending upon whether they are classified as regulatory (permit, posting or record-keeping), general (direct relationship to safety and health of employees), serious (could cause death or serious physical harm from an actual hazard created by violations) or willful (employer had actual knowledge of an unsafe condition and made no attempt to correct or the offender is a repeat offender). Fines for a regulatory violation range from $500 to $12,756 per violation. General violations range from $1,000 to $12,726 per violation and serious violations range from $18,000 to $25,000 per violation. Repeat offenders have their fines multiplied by a number based on the number of times such a violation has occurred. Willful violation can result in penalties that are multiplied by five with fines ranging from $9,090 up to $127,254 per violation.

The need to control bloodborne pathogens and infection-control provisions contained in OSHA regulations are well-known by dentists. Failure to follow such precautions, if found to be willful, can result in additional penalties separate and apart from OSHA fines.

Repeated, serious and willful OSHA violations may increase a dentist’s insurance rates for workers’ compensation insurance premiums. While injuries to workers are generally handled under the no-fault workers’ compensation system, the amount of an injured worker’s award is increased by 50% if the injury was caused by willful violation of OSHA. In the more serious cases, criminal actions may be brought against the OSHA violator for death or permanent injury due to a willful violation of OSHA safety or health standards. Penalties for violating radiation-control laws are considered a crime with fines not to exceed $1,000 and, in severe cases, imprisonment up to six months. If the violation is deemed willful or through gross negligence, the fines can increase to $5,000.

In a new expansion of liability for OSHA violations, the California Supreme Court allowed a separate cause of action to be brought based on violations of OSHA regulations outside of the workers’ compensation system. The court allowed a local district attorney to obtain damages against an employer for an industrial injury in which the employer violated OSHA standards using the Unfair Competition Law of California and false advertising law. This ruling expands the class of people and remedies that may be sought for OSHA violations and avoids the limitations in remedies in the workers’ compensation
system. This ruling likely allows employees to sue their employers as a private attorney general to seek restitution and attorney's fees for a violation of OSHA regulations.

Safety provisions related to the duty to warn of hazardous products used in the dental office require employees and patients to be informed that they may be exposed to chemicals that can cause cancer or reproductive harm. That statute requires that "no person in the course of doing business shall knowingly or intentionally expose an individual to a chemical known to the state to cause cancer or reproductive toxicity without first giving a clear and reasonable warning to such individual, except as provided in Section 25249.10." The main chemicals mandating warning in a dental office appear to be mercury and nitrous oxide. The obligation to provide these warnings applies to businesses with 10 or more employees. The governmental body that enforces these requirements is the Office of Environmental Health Hazard Assessment (OEHHA). The OEHHA has a warning on its website (www.P65warnings.ca.gov) that it recommends for use in dental offices discussing the effects of mercury and nitrous oxide. The cost of noncompliance is severe. Legal actions enforcing these provisions can be brought by either the attorney general's or district attorney's office or can be enforced by any person in the public interest. Remedies include injunctions to require compliance with the provisions and fines in the amount of $2,500 per day for each violation with the maximum fine of $912,500 (based on a one-year statute of limitations). Private individuals are encouraged to bring such suits as they are entitled to retain 25% of the civil penalties plus attorney's fees.

Another regulatory statute that attempts to foster safe practice is the Controlled Substance Utilization Review and Evaluation System (CURES) designed to reduce prescription drug abuse. The purpose of this law is to require health care practitioners to check the CURES database to obtain patient activity reports to verify the identity of other providers of such medication and the amount being used. This data request must be undertaken upon first prescription of the medication and every four months if the medication continues to be used. It is suggested that the checking of this database be noted in the treatment records. No specific acts are mandated following review of the patient activity report, but appropriate recommendations are needed when evaluating the patient's medication use. If it is believed that medication use is excessive, counseling of the patient for appropriate care, including pain management or substance abuse treatment, is recommended. If other providers prescribing controlled substances are found, communication and coordination of prescriptions is suggested. Enforcement of these statutes is left to the dental board and the failure to comply with this statute does not create a private cause of action against a health care provider. Notwithstanding, in a lawsuit involving injuries that could have been avoided with the use of the information in the CURES database, a patient's attorney will likely contend that this section is the standard of care for monitoring medications and managing such usage and a failure to comply with the statute is negligent.

Regulatory penalties and fines are not the only risks of failing to comply with safety statutes. The laws themselves can be used to establish the standard of care. If a dentist violates safety standards resulting in an injury to a third party, the injured party's attorney, through an expert witness, will likely use the safety statute to demonstrate the standard of care, and a statutory violation will be a basis for an opinion that such conduct constitutes negligence. In certain situations, a statutory violation can eliminate the need for expert witness testimony as negligence can be presumed from a statutory violation if the person suing is the type of person that the safety statute was designed to protect. This rule, generally known as the doctrine of negligence per se, means that where the court has adopted the conduct prescribed by statute as the standard of care for a reasonable person, a violation of the statute is presumed to be negligence. This presumption can be negated by proof that the statutory violation was reasonable but the burden of proving it is reasonable is placed on the person who violated the statute.

Strict compliance with regulatory statutes is required to prevent fines and, in rare cases, criminal penalties. Failure to comply may form the basis for a lawsuit to compel such compliance, or if someone is injured it may form the basis of a negligence claim.

Liability for Negligence Based on Unsafe Practices

Failure to practice safely can result in liability for negligence. Two types of negligence may be implicated: general negligence or professional negligence. General negligence principles apply to negligence that does not arise from the rendering of services for which the health care provider is licensed (i.e., general safety violations applicable to
all businesses). Professional negligence applies to any acts that have an integral relationship to the provision of health care. The differences between these types of negligence can profoundly affect proof and damages. General negligence allows a jury to determine liability based on whether they believe the tortfeasor acted reasonably under the circumstances. Medical negligence requires expert testimony by a licensed dentist to prove a breach of the standard of care and is governed by the provisions of the Medical Injury Compensation and Recovery Act (MICRA), which limits damages and imposes other procedural requirements.

General negligence is limited to a dentist’s failure to maintain their office. Cases have included slip-and-falls in or around the office that result in patient injuries due to a failure to repair broken sidewalks, failure to clean up spilled liquids, failure to ensure clean restrooms or failure to properly maintain office furniture. These types of injuries are likely governed under general negligence standards. Safe dentistry requires that a dentist as a business owner be aware of risks in and about their property and take reasonable precautions to warn of such risks and in a reasonable time repair those conditions. Similarly, dentists must maintain reasonable inspection plans and identify, clean up and warn of dangerous conditions that they are informed of or should have been aware of on their property. They should also know the limitations of their furniture and equipment and promptly repair malfunctioning equipment.

Most of the injuries that occur in or around the dental office will be governed by the rules of professional negligence. Examples of cases that create questions as to general and medical negligence occur when proper practices are not maintained to protect patients from injuries when they are in vulnerable conditions before and after treatment. In a recent case, this question arose when a rail on a hospital bed failed to prevent a patient from falling out of the bed. The court found in that case that the standards of medical negligence applied as the patient’s injury resulted from the “alleged negligence in the use and maintenance of equipment needed to implement the doctor’s order concerning her medical treatment.”

Safety in the dental office mandates that the dentist trains staff and ensures compliance with safety practices in the office to protect patients. Examples include the creation of rules and compliance with procedures in the use of bed rails for patients recovering from anesthesia post-oral surgery to prevent a patient rolling off of the bed. Other cases have arisen when patients were wheeled out of the office in wheelchairs that had no arms, resulting in patient falls. In an unusual case, it was alleged that a staff person failed to ensure that a postsurgery patient could walk to have a standing X-ray taken. In that case, the person fell, which caused a fractured jaw. Thoughtful safety plans and staff training can prevent these acts or omission that can result in preventable injuries.

Tort liability may also arise from the use of dental equipment that may cause injury. Examples of this type of injury are patients experiencing facial burns due to overheated handpieces. Common issues in these cases involve the cause of the overheating, the dentist’s monitoring of the heat buildup and the dentist’s technique in allowing the handpiece to contact the patient’s skin. It is incumbent on the dentist to ensure that devices are properly cleaned and maintained. This necessitates the dentist’s awareness of the manufacturer’s instructions for the cleaning postprocedure and proper maintenance including lubrication and professional inspection. These requirements vary by manufacturer and change over time requiring the dentist to read package material and warnings sent by the manufacturer to ensure compliance with company recommendations. Secondly, to prevent injury, dentists must monitor heat buildup during procedures. They should also ensure that the devices are not used for an excessive period of time and that proper irrigation is used. If a handpiece overheats, it should be promptly taken out of service and sent for repair. Lastly, the dentist should ensure adequate retraction and proper positioning to ensure that the patient is not touched by the hot handpiece.

Other issues arose in a series of cases involving severe necrosis of the mandible and maxilla during metal post removal. In three cases, patients experienced severe bone and tissue necrosis following post removal using piezoelectric devices. Questions arose as to the cause of these injuries and the reasonableness of the dentists’ monitoring of the heat buildup. Testing revealed that rapid temperature rises can occur if copious irrigation is not utilized. Questions arose in these cases as to how long the piezoelectric device could be used before the post needed to be checked for heat buildup and how such monitoring should be undertaken. Safe dentistry requires foresight as to the possible risks and reasonable actions to protect patients from injuries.

Other situations that have resulted in injuries include common occurrence not recommended by manufacturers. Any...
example occurred when a dentist purposely bent an anesthetic needle to facilitate mandibular block injections. In that case, the bent needle contacted the ramus causing the needle to separate. While bending needles is performed by many practitioners, no manufacturer will ever say that is proper for their equipment. In this case, the initial problem was exacerbated as the dentist used a short rather than long anesthetic needle. The result was that following the separation the needle could not be retrieved and it became imbedded in the soft tissue. Due to proximity to nerves and other vital structures, oral surgeons were hesitant to remove it. The needle migrated and was eventually removed using an extroral approach that caused nerve damage and permanent scarring. Safe use of properly sized equipment could have prevented this injury.

Preventable injuries may also occur in the use of medications. Dentists should not rely on pharmacists to identify the risk of adverse drug interactions. Safe practice requires the dentist to be aware of all medication a patient is taking and to verify that a new medication will not cause a known side effect. In one case, a dentist was called late at night by a patient complaining of pain and swelling. The patient refused to come to the office for immediate evaluation, so the dentist prescribed an antibiotic over the phone. The patient was taking many medications and the dentist did not have access to the treatment records at home to verify those medications. The patient provided an incomplete history of the medications he was taking when talking to the dentist. The dentist prescribed an antibiotic the patient had used in the past but was unaware the patient was taking a new medication. The patient was diagnosed with rhabdomyolysis a few weeks later, which resulted in kidney failure complicated by a heart attack that almost resulted in the patient’s death. The patient filled all his prescriptions at the same pharmacy (a circumstance that the dentist cannot rely on) and the pharmacist should have been alerted to the potential adverse reaction but either ignored or did not receive the warning. This case resulted in litigation involving both the dentist and the pharmacy. The safety lessons learned were not to prescribe medications over the phone, to verify all medicines a patient is taking before prescribing and to not rely on the patient or pharmacy to identify adverse interactions. This case occurred before the ubiquitous presence of cellphones and tablets that allow for easy access to electronic records and software programs to verify drug interactions.

A common and preventable injury that could be eliminated with adequate safety procedures is the treatment or extraction of the wrong tooth. The correct tooth should be verified during a timeout prior to beginning any procedure. The causes of wrongful extractions are numerous and range from receiving a referral by telephone with the incorrect tooth noted in the appointment book, failure to place emailed referrals into the treatment records, incorrect information provided by insurance authorization identifying the tooth to be extracted, reliance on the patient to identify the tooth to be removed, the extracting dentist relying on his or her judgment as to the tooth to be removed based on the pathology in the mouth, confusion on tooth numbers based on missing or migrating teeth, confusion in the anatomy due to the presence of supernumerary teeth or impacted teeth and the dentist mistakenly extracting the wrong tooth. The incidence of this type of injury can be reduced by undertaking a necessary timeout to ensure receipt of a written referral, radiological and clinical verification of the correct tooth to be removed and patient agreement as to the tooth to be removed. If there is any confusion or inconsistency, the referring dentist may be contacted to seek clarification and, preferably, to have this documented in writing and placed in the patient records. The best way to prevent wrongful extractions is for the general dentist to send written referrals to the surgeon and the surgeon ensuring receipt of such referrals before the extraction and to take a timeout to verify that the correct tooth is being removed.

Safe practice also requires dentists to recognize their competence to provide a procedure and to refer when appropriate. Many dentists may, for financial or other reasons, seek to ensure that all treatment is provided in their office. If a general dentist performs treatment in the realm of a dental specialist, the standard of care applied is what a reasonable and prudent dental specialist would have done in the same or similar situation. Safe practice requires a general dentist to know how to treat the condition and to know how to recognize and treat any complications that arise. If the general dentist cannot manage a complication, prompt recognition and referral to a qualified dental specialist is required. In practices that utilize in-house specialists, the safety of the patients mandates that the dentist evaluate whether treatment requiring specialty care can be delayed until the in-house specialist is in the office or if prompt care is necessary. In addition, the patient should be informed...
of the option of prompt treatment by an outside specialist versus delayed treatment by the in-house specialist. Failure to utilize proper judgement in these situations may result in a finding of negligence.

Safe practice also requires dentists to allocate sufficient time to perform thorough examinations and appropriate review of X-rays. This allows for the creation of comprehensive treatment records that document pertinent findings and, if necessary, the need for future evaluation. Desire or compulsion to maximize production can result in dentists failing to diagnose pathology evident in intraoral exams or X-rays resulting in significant liability. In a recent case, failure to diagnose pathology evident in an X-ray taken during a free orthodontic screening exam resulted in delayed diagnosis of pathology. Even if a limited examination is performed, safe practice requires comprehensive evaluation of all pathoses evident in that exam or X-ray. The desire to maximize efficiency is not an excuse for failure to perform a thorough examination. Overscheduling can lead to the unsafe practice of dentistry and legal liability.

A further necessity for safe practice is adequate documentation in a legible fashion. This is true in all practices, but in particular in a multi-dentist office when patients are not always seen by the same dentist. A dentist cannot be expected to recall what a patient’s prior conditions are and if there is any condition that was to be monitored at future appointments that will not be performed unless such conditions are noted in treatment records. Not only is it necessary for the treating dentist to verify a patient’s subjective complaints, objective findings, assessment of treatment options and plan for future care, referring dentists or future dentists also need this information that can be gained through comprehensive treatment records. Not only does this foster safe practice, but it also may reduce the risk of liability or adverse dental board findings. Patients’ attorneys and dental board investigators are less likely to bring lawsuits or accusations if the treatment records are complete and legible and clearly document proper evaluation and rationale for care.

Thorough and safe practice is reasonable practice that may avoid liability for negligence and prevent lawsuits. Monetary penalties by regulation or legal actions are not the only compulsion to practice safely. Unsafe practice can also result in sanctions against a dentist’s license.

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**Dental Board and Safe Dental Practices**

Another component of the legal consequences of safety in the dental office is the regulatory function of the dental board to ensure the safe practice of dentistry and to discipline practitioners who do not practice safely. The stated purpose of the dental board is to protect public safety.29 The regulatory function of dentistry includes its powers of rule-making, its requirements of proper education for licensure, proper permitting to allow dentists to perform specific acts and the right to discipline those dentists who practice unsafely.

An example of the dental board rule-making function to promote patient safety is its mandate for establishing rules and regulation governing a minimum standard of infection control.30 These minimum standards were codified in the California Code of Regulations.31 These rules require that all dental health care personnel comply with minimum requirements that include the use of personal protective equipment, needle and sharp safety, sterilization of instruments, disinfection of the dental office, proper use of dental unit waterlines and the handling and disposal of contaminated waste products including needles and sharps.

The dental board rules also include establishing minimum educational standards for the admission practice of dentistry.32 The dental board rules preclude performing dentistry by an unlicensed person and governs the issuance of special permits, including oral surgery permits, for persons practicing under a dental license.33 To further protect the public, the dental board mandates that all personnel using radiation equipment complete radiation safety courses.34 The dental board further seeks to protect patients when dentists utilize sedation and anesthesia. This includes specific permits for general anesthesia,35 conscious sedation36 and oral sedation.37 Each of these permitting requirements requires minimum education to obtain the permits and subsequent continuing education to maintain such permits. The dental board rule-making authority also extends to the use of restorative dental materials and the need for patient education through requirements for fact sheets to educate patients on the risks and efficacy of different dental materials.38

The dental board has the power to enforce these safety regulations by the power to revoke or sanction the licensee who violates safety standards or who commits unprofessional conduct, is incompetent, grossly negligent or undertakes repeated acts of negligence or other causes for violations.39
The Dental Practice Act enforced by the dental board establishes specific acts that constitute unprofessional conduct, a number of which require the safe practice of dentistry. Safely-related acts of unprofessional conduct include ensuring that licensed personnel practice dentistry lawfully; the proper procurement, dispensing and administration of dangerous drugs or controlled substances in violation of the law; unsanitary or unsafe office conditions as determined by the customary practice and standards of the dental profession; the failure to properly use nitrous oxide; and the knowing failure to protect patients by failing to follow infection-control guidelines including bloodborne infectious disease standards and OSHA regulations.

The dental board also specifically seeks to protect the public by precluding use of instruments or devices not in accordance with customary standards.

The dental board has the right to perform inspections particular in the areas of anesthesia and radiation safety as another means to ensure safety in the dental practice.

The actions of the dentist are not the only focus of safe dentistry. The safe operation of a dental practice requires all members of the dental team to be aware of the appropriate scope of practice to ensure that treatment is performed by licensed personnel with the proper training and under proper supervision. Failure to do this can lead to patient injuries or sanction of the dentist’s license. To practice safely, dentists must be aware of proper actions that may be performed by each staff member and what treatment can be performed under general supervision (when the dentist is not in the office, but pursuant to an agreed plan of treatment) versus direct supervision (with the dentist present in the office). Knowledge of the scope of practice and proper training of staff to ensure compliance with this scope of practice is a necessary component of safe dentistry and a particular focus for dental board investigators.

Conclusion

While most dentists desire to practice safely, there are multiple forces that may result in dentists’ failure to meet all safety-related requirements. Compulsions to practice unsafely due to financial pressures, ignorance or inattention can damage a practice as the law provides multiple avenues to sanction the unsafe practice of dentistry. Multiple governmental agencies also retain regulatory power to sanction unsafe practice, which is enforced with fines and administrative penalties particular in the area of employee and patient safety in the workplace. If the unsafe acts of the dentist injure a patient or other third party, the legal system allows private lawsuits for damages to be obtained for such safety violations.

Lastly, the dental board retains regulatory powers to impose penalties including limitations or, in the worst cases, revocation of the right to practice dentistry if a dentist practices unsafely. This triad of regulatory penalties, legal actions by injured parties and restrictions placed on dentists’ licenses to practice provide strong incentives for dentists to fulfill their obligations to practice safely and protect their patients and the general public.

REFERENCES
5. California Code of Regulations Title 8, Subchapter 7, Group 16 Article 109 §5217.

The Author, Steven Barrabee, Esq., can be reached at sbarrabee@professionals-law.com.
QUESTIONS MOST OFTEN ASKED BY SELLERS:

1. Can I get all cash for the sale of my practice?
2. If I decide to assist the Buyer with financing, how can I be guaranteed payment of the balance of the sales price?
3. Can I sell my practice and continue to work on a part time basis?
4. How can I most successfully transfer my patients to the new dentist?
5. What if I have some reservation about a prospective Buyer of my practice?
6. How can I be certain my Broker will demonstrate absolute discretion in handling the transaction in all aspects, including dealing with personnel and patients?
7. What are the tax and legal ramifications when a dental practice is sold?

QUESTIONS MOST OFTEN ASKED BY BUYERS:

1. Can I afford to buy a dental practice?
2. Can I afford not to buy a dental practice?
3. What are ALL of the benefits of owning a practice?
4. What kinds of assets will help me qualify for financing the purchase of a practice?
5. Is it possible to purchase a practice without a personal cash investment?
6. What kinds of things should a Buyer consider when evaluating a practice?
7. What are the tax consequences for the Buyer when purchasing a practice?

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Making Dentistry Even Safer: Understanding the Proper Choice and Use of Emergency Medications

Mark Donaldson, BSP, ACPR, PharmD, and Jason H. Goodchild, DMD

ABSTRACT It is vital that oral health care practitioners and the entire office team be vigilant in recognizing signs of patient distress and trained to take appropriate action when needed. This involves inculcating all staff on a culture of safety that includes training in the recognition and management of medical emergencies, basic life support training, mock drills, prescribed individual responsibilities and stocking of appropriate equipment and emergency medications.

The American Dental Association (ADA) defines a medical emergency in the dental office as an “unexpected event that can include accidental or willful bodily injury, central nervous system stimulation and depression, respiratory and circulatory disturbances as well as allergic reactions.” Although uncommon, medical emergencies in the dental setting can range from conditions that are not life threatening to fatal situations and oral health care professionals (OHCPs) must be capable of recognizing and managing them appropriately. In an early survey by Fast and colleagues, 1,605 respondents reported 16,826 emergencies over a 10-year period, an average of approximately one emergency per OHCP per year. Another survey by Malamed reported 13,776 medical emergencies by 2,704 OHCPs over the same time frame, in this case indicating an incidence of two emergencies per OHCP per year. A study by Laurent reported an incidence of 2.1 medical emergencies per OHCP per year among OHCPs in France and Belgium, and two other international studies found that two-thirds of OHCPs had encountered a medical emergency in the dental setting within the last year. The most encountered medical emergency among these studies was syncope, followed by orthostatic hypotension, asthmatic attack, hypoglycemia, allergy, cardiovascular-related emergencies, seizures and stroke.
It is important to note that this manuscript is specifically for adult patients and is not fully applicable to the pediatric patient. Some of the medications listed may be for adults who are accompanying the patient and have no indications for pediatric use. It is the choice of the practitioner to carry these medications if the practice only treats pediatric patients.

In 2017, a white paper by Sangrik for the American Academy of Dental Boards hypothesized that “medical emergencies during dental treatment are increasing in frequency, intensity and diversity” for reasons such as an aging and more medically complex patient population, more invasive dental treatment and an increasing trend of in-office sedation. Although medical emergency preparedness involves factors such as equipment, drugs, training and teamwork, the most important aspect involves a culture of safety within the dental office. The OHCP must inculcate and require that everyone in the office follow basic steps for safely treating dental patients including the collection of accurate and up-to-date medical and pharmacological history information, baseline vital statistics, consideration of the American Society of Anesthesiologists Physical Status Classification (last amended in 2014) and possible airway compromise. Algorithms and mnemonics exist to describe a series of actions that if properly followed can improve outcomes during emergencies. For example, the American Heart Association’s Chain of Survival is intended to describe actions that can decrease mortality during sudden cardiac arrest. Roberson and Rothman describe Six Links to Survival when preparing for medical emergencies in the dental office: doctor training, staff training, medical emergency plan, emergency drug kit, proper equipment and mock drills. Most important, the PABCD mnemonic describes the critical factors of patient management when urgencies or emergencies arise in a dental patient prior to a definitive diagnosis: P = positioning, A = airway, B = breathing, C = circulation and D = considering definitive treatment, differential diagnosis, drugs or defibrillation. In his article on pediatric medical emergencies, Rothman describes an additional P for prevention in his mnemonic PPABCD, perhaps the most important component to improving safety in the dental office.

### Recommended Basic Emergency Equipment

<table>
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<tr>
<th>Equipment</th>
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<tbody>
<tr>
<td>Stethoscope and blood pressure monitoring device (appropriate-sized cuffs)</td>
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<td>Yankauer suction tips and portable handheld suction pump</td>
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<tr>
<td>Glucometer and lancets</td>
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<tr>
<td>Adult-sized and child-sized oropharyngeal airways</td>
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<td>Magill forceps</td>
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It is also important to recognize that dialing 911 alone is not adequate emergency treatment. Additionally, using a cellphone to call EMS may actually delay treatment. If the call is made near a highway, it could be routed to a central call station that then must contact local EMS, costing precious minutes in the rescue of the compromised patient. Depending on the practice location and the amount of time required for help to arrive, the PABCD and Six Links to Survival must be used. When a medical emergency arises, OHCPs need to not only be familiar with the medications they have available in their emergency kit but know how to use them safely and correctly. The purpose of all emergency care is rescue or the ability to stabilize and maintain the patient until additional help and potential transport arrives.

In 2013, the California Dental Association posted an online article titled “Emergency kit basics for dental practices.” The article lists the basic equipment that dental offices should stock for patient and employee medical emergencies; additional items are listed in Table 1. The drugs that at a minimum should be included in the emergency kit are listed in Table 2.

### Table 1

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### Table 2

<table>
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<tr>
<th>Seven Drugs Comprising the Minimal Dental Emergency Kit</th>
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<tr>
<td>Epinephrine 1:1,000 (injectable)</td>
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<tr>
<td>Histamine blocker (injectable)</td>
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<tr>
<td>Nitroglycerin (sublingual tablet or aerosol spray)</td>
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<tr>
<td>Aspirin (oral tablet)</td>
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<tr>
<td>Bronchodilator, β2-adrenergic receptor agonist (inhaled)</td>
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<tr>
<td>Glucose (oral)</td>
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<tr>
<td>Aromatic ammonia (inhaled)</td>
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* Other sources also commonly include oxygen as an emergency drug, together with equipment to deliver it under positive pressure for a nonbreathing patient.
Patient safety is the primary concern. This article reviews the proper use and delivery of the essential emergency medications included in a basic drug emergency kit that should be in every dental office, while providing new information and challenging historical dogma around the value of certain products (i.e., ammonia inhalants and autoinjectors). It is important to note that individual specialties (e.g., oral surgeons, pediatric dentists) and offices that provide sedation may require additional drugs (e.g., reversal agents) and advanced airway management equipment as well as additional training such as pediatric advanced life support or advanced cardiac life support and health care basic life support.9,16 OHCPs should also review and be compliant with the applicable regulations in their specific area of practice and in their individual states.

The Minimal Dental Emergency Kit

Medical emergency kits for the dental office can be purchased as a preassembled kit (often including the needed excipients) or the individual drugs and equipment can be purchased separately and stored together in an emergency box. There are advantages and disadvantages to each solution. The commercially available kits usually come with a concierge service that will monitor drug expiry dates and automatically send new medication when needed. However, they are often expensive and contain more equipment and additional medications than what is listed in TABLES 1 and 2. Cost notwithstanding, having only the most important equipment and medications can prevent confusion and inadvertent errors during an emergency. Kits assembled piecemeal can be more cost-effective, but the onus is on the OHCP to ensure that the kit is adequately stocked with medication and excipients and to monitor and replace medications before their shelf life expires.

Whether the kit is purchased preassembled or created by collecting the individual parts, a drug emergency kit should only include medications for which the OHCP has knowledge and has had training to fully understand how and when to deliver the medication safely.14 However, according to the Sangrik white paper, when dental board executive directors or equivalents were asked if their board required dental offices to stock emergency medications, only six responded that the basic seven medications were required (one state's dental board responded that the seven medications were only recommended and another responded that a first aid kit chosen by the OHCP was required but no specific drugs were outlined). Only 38 of 53 dental boards from 50 states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands responded to the survey.9

Regardless, there is consonance among many dental experts that the minimal dental emergency kit should be composed of at least seven medicines: epinephrine, an injectable antihistamine, nitroglycerin, aspirin, a β, adrenergic receptor agonist, glucose and aromatic ammonia.2,16,19 Other sources also commonly include oxygen as an emergency drug together with the equipment to deliver it under positive pressure for a nonbreathing patient using a self-inflating bag-valve-mask system.9,15,17

The decision to include these medications is primarily based on the historical findings of the most common medical emergencies experienced as described above. Even if dental offices stock these agents, however, given the low overall incidence of medical emergencies, individuals may have limited experience accessing and delivering these medications appropriately. This results in a significant challenge because many of these medications require additional knowledge or manipulations to administer them safely and effectively, and in an emergency situation some critical steps may be unintentionally missed and result in further patient harm.

Epinephrine 1:1,000 (injectable)

Epinephrine is an endogenous catecholamine that stimulates both α- and β-adrenergic receptors and is the single most important injectable drug in the emergency kit.16 It is the drug of choice for treating respiratory and cardiovascular manifestations of acute, accelerated allergic reactions. Epinephrine causes bronchodilation and increased systemic vascular resistance, arterial blood pressure, heart rate, myocardial contractility and myocardial and cerebral blood flow when administered in resuscitative dosages.5,20 For treatment of life-threatening signs and symptoms of an acute allergic reaction, the clinician must administer epinephrine immediately, injecting the drug intramuscularly (0.3mg [0.3mL])
of a 1:1,000 epinephrine solution for adults or 0.15mg [0.15mL] of a 1:1,000 epinephrine solution for pediatric patients). A second dose should be administered within five to 15 minutes of the initial dose because of the short half-life of epinephrine (two minutes) and in the absence of clinical improvement. Epinephrine is also indicated for the treatment of acute asthmatic attacks that are unrelieved by β2-adrenergic receptor agonists such as albuterol. In either case and regardless if symptoms improve, emergency medical services (911) must be activated and the patient should have immediate medical follow-up.

Epinephrine is available in ampules and vials as well as in preloaded syringes or autoinjectors for immediate use. Caution should be exercised with autoinjectors, however, because there is a growing body of evidence that the currently supplied needle length may be too short to be effective in larger patients. With the geometric rise in the prevalence of Type 2 diabetes combined with the associated increase in obesity rates, several studies have shown that the standardly equipped, 28-gauge, 1.5 cm (0.5 inch) needle may be inadequate to deposit epinephrine into the rich capillary bed beneath the vastus lateralis muscle in order for systemic epinephrine levels to rise fast enough and high enough to save the patient’s life. A 1.6 cm (0.63 inch), 2.5 cm (1 inch) and 2.5–3.8 cm (1–1.15 inch) needle has been suggested as being more appropriate for infants, children and adults and large adults, respectively.

Much has been published recently about the exorbitant price increases of autoinjector formulations have been designed for both the nonhealth care professional and the trained health care worker to inject, the delivery mechanism is not entirely intuitive and has led to inadvertent lacerations and self-injections. Once removed from the plastic case, the instructions are to first remove the cap that is covering a hole. Intuitively, the hole appears to be where the needle must come out while the opposite end of the autoinjector has the appearance of a button given its distinctly different color and over which you would naturally place your thumb in order to administer the injection. Unfortunately, because of this poor design, during a stressful event such as a life-threatening medical emergency, autoinjector self-injections still occur because the button end is actually where the needle comes out. Every year there are multiple reports of these accidental self-injections in the primary literature, to include a meta-analysis on this topic, bringing the safety of this dosage formulation into question. For all of these reasons, it may be safer, less expensive and more efficacious to stock epinephrine 1:1,000 in the ampule or vial formulation for an intramuscular injection utilizing the appropriate-length needle.

Histamine blocker (injectable)

Histamine blockers are indicated for patients with mild or delayed-onset allergic reactions to reverse the actions of histamine by occupying H1-receptor sites on the effector cells. Diphenhydramine is the most common representative of this general drug class and is typically administered as a 50 mg intramuscular (deltoid) injection followed by 25 to 50 mg orally every three to four hours for up to three days after such a reaction. It is important to note that oral antihistamines are not emergency medications and in most cases the OHCP should not provide them to the patient. If a patient has an allergic, histaminic reaction in which an injectable histamine blocker is administered in the dental office, the patient should follow up with a physician immediately. In the emergency department or urgent care clinic, the physician will determine whether additional treatment with glucocorticoids or oral antihistamines is indicated, but neither of these drugs should be considered part of the minimal dental emergency kit.

Nitroglycerin (sublingual tablet or aerosol spray)

Nitroglycerin for the dental office is available as sublingual tablets or translingual sprays. Nitroglycerin is the treatment of choice for the patient with angina who may experience acute chest pain. It acts primarily by dilating systemic venous and arterial vascular beds,
relaxing vascular smooth muscle, which leads to a reduction in venous return and systemic vascular resistance. These actions of reestablishing the balance between oxygen demand and oxygen supply in the coronary circulation result in the elimination of the chest pain. The clinician should be prepared to administer one tablet or metered dose spray (0.4 mg) if the patient does not bring his or her own nitroglycerin to self-administer. This dose can be repeated twice at five-minute intervals for a total of three doses and relief should occur within one to two minutes. If the discomfort is not relieved after three doses of nitroglycerin, the OHCP must consider a diagnosis of evolving myocardial infarction discussed below. Regardless, there are some very important considerations in administering nitroglycerin to patients whether the sublingual tablet or translingual spray is going to be used.

Before administering nitroglycerin to a patient suspected of experiencing anginal pain potentially brought on by the stress of the dental procedure, the OHCP must confirm that the patient has not received a phosphodiesterase inhibitor within the last 24 to 48 hours (i.e., 24 hours for sildenafil [Viagra, Revatio] and vardenafil [Levitra] and 48 hours for tadalafil [Cialis]).17–40 These medications are also potent vasodilators and the combination can result in a life-threatening precipitous reduction in blood pressure.17,41 If the patient has had one of these medications recently, the prudent OHCP should call 911 and the patient should be taken to the emergency room; nitroglycerin should not be administered by the OHCP. It is also important to remember that all patients, males and females, with a history of angina need to confirm phosphodiesterase inhibitor usage prior to nitroglycerin administration because these drugs are used to treat pulmonary hypertension and not just erectile dysfunction.

If the patient experiencing anginal pain has brought their own oral tablets and does not receive relief after two doses, the OHCP could administer their own nitroglycerin as the third dose prior to considering a 911 call. Nitroglycerin tablets are hygroscopic and should be replaced with a fresh supply within 30 days once opened. Many patients exceed this shelf-life and subsequently the potency and efficacy of their nitroglycerin tablets decreases. If the third dose of the medication from the OHCP’s fresh supply resolves the angina pain, the patient should be counseled to replenish their prescription with a fresh supply of medication after the conclusion of the dental appointment. As an I-C recommendation*, the current American College of Cardiology and American Heart Association guidelines do recommend a call to 911 if no relief of chest pain or related symptomatology is achieved after even just one dose of nitroglycerine (sublingual or spray).42

The aerosol spray of nitroglycerin also has some unique manipulation required prior to effective administration. Once the product is removed from the box and the cap is taken off, the actuator should be pressed several times to ensure a mist of medication is being delivered prior to administration. This dosage form is a pump that requires priming, especially if it is not used frequently. Without priming the pump, the OHCP is simply delivering air; after three attempts at reversing the anginal pain, a potentially unnecessary call to 911 could have been avoided simply by ensuring the patient received active medication.

If the patient has never received a diagnosis of angina pectoris and develops symptoms of a possible acute myocardial infarction, such as chest pain or chest pressure, or if the anginal pain does not respond to three doses of nitroglycerin as indicated in the angina patient, the clinician should call 911 and administer aspirin.

Aspirin (oral tablet)

Acetylsalicylic acid (ASA, aspirin) tablets reduce the risk of death from a myocardial infarction (MI) when administered as nonenteric, noncoated formulations of 162–325 mg. (This was confirmed by the 1988 landmark trial Second International Study of Infarct Survival (ISIS-2) in which more than 17,000 patients were enrolled. According to the study, the group receiving aspirin showed a 23% reduction in cardiovascular mortality in five weeks.43) In the case of a suspected MI, the OHCP should first call 911 to initiate the emergency response team, followed by PABCD, which for a conscious patient primarily includes positioning and

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*Medical evidence used in developing recommendations in these guidelines classifies an I-C recommendation as having evidence or general agreement that a specific procedure or treatment is useful and effective, procedure or treatment should be performed or administered [“*”]. The weight of the evidence is then ranked according to the aggregate source or sources of that data, with “C” being the lowest weighting: C (lowest). The primary basis for the recommendation is a consensus of expert opinion, case studies or accepted standard of care.
administering aspirin. The aspirin should be chewed and swallowed. Timing is very important because many of these patients lose consciousness, in which case oral aspirin cannot be administered and therefore the antiplatelet benefit of aspirin will not be received. Patients should be kept comfortable until medical help arrives and OHCPs should be prepared to provide cardiopulmonary resuscitation (CPR) if required. Monitoring the patient’s vital signs during this critical period is also advised.

Historically, the American Heart Association, educational videos, universities and websites have commonly used a mnemonic for morphine, oxygen, nitrates and aspirin (MONA) to refer to the adjuvant treatment used for the management of a suspected MI. Recent scientific data now refute this strategy and MONA should be viewed as an obsolete teaching and learning aid. Morphine is associated with delayed activity of platelet inhibitor drugs in patients presenting with ST-elevation myocardial infarction (STEMI). In 2017, the Determination of the Role of Oxygen in Suspected Acute Myocardial Infarction (DETO2X-AMI) trial enrolled acute coronary syndrome patients with an oxygen saturation of ≥ 90% to receive oxygen supplementation versus inhalation of ambient air. There was no statistically significant difference in one-year, all-cause mortality observed between groups and supplemental oxygen is no longer a class IA recommendation in managing patients with a suspected MI. Regarding nitrates, randomized-controlled trials have shown that their use in suspected MI could not provide a benefit in terms of improved mortality or adverse cardiovascular outcomes. Only aspirin has been shown to offer a consistent benefit in this patient population.

**Bronchodilator, β2-adrenergic receptor agonist (inhaled)**

The most common β2-adrenergic receptor agonist used to treat acute bronchospasm that may be experienced during an asthmatic attack or anaphylaxis is albuterol administered via inhalation. Albuterol relaxes bronchial smooth muscles and inhibits chemical mediators released during hypersensitivity reactions. Unlike other β2-adrenergic receptor agonists, albuterol is an excellent choice because it is associated with fewer cardiovascular adverse effects than other bronchodilators. In the case of a patient experiencing acute asthma in the dental office, possibly in response to the stress of the dental procedure, it is important for the OHCP to be prepared by having the patient with a history of asthma bring in their own rescue inhaler or to have the office inhaler close by. The inhaler has three parts: a cap covering the mouthpiece, the canister of aerosolized medication and the boot (a plastic case in which the canister resides).

The challenge with inhalers is twofold once the mouthpiece cap is removed: The canister needs to be shaken several times prior to administration; if the patient is unable to self-administer the medication, the OHCP needs to coordinate actuation of the canister with the patient’s inhalation while their lips are held tightly around the mouthpiece. Given the typical dose in this situation is four to eight inhalations every 20 minutes for up to four hours then every one to four hours as needed, the correct delivery of this medication is very difficult during a stressful situation. In this case, it may be advisable for OHCPs to also have a spacer device on hand.

Once the cap over the mouthpiece is removed and the canister is shaken, the mouthpiece easily attaches to one end of the spacer device. Spacers come in different shapes and sizes, but the technology is essentially the same allowing for the actuation of the canister to deliver medication that is confined in the chamber of the spacer until the patient inhales through the one-way valve at the other end of the spacer. This removes the need to coordinate actuation of the device with the patient’s inhalation and makes the delivery of medication easier and more effective.
Glucose (oral)

Hypoglycemia is one of the most common medical emergencies given the increasing prevalence of diabetes in the general population. The Centers for Disease Control and Prevention predicted in 2010 that as many as 1 in 3 U.S. adults could have diabetes by 2050. More recently, the National Health and Nutrition Examination Survey (NHANES) data have predicted that 50% of the U.S. population will have either prediabetes or diabetes by the year 2050.

Hypoglycemia is defined as an episode of abnormally low plasma glucose levels (usually occurring when a patient’s blood glucose drops below 70 mg/dL) with associated symptoms that resolve with administration of oral glucose and restoration of euglycemia. Historically, the treatment of choice was sugar in the form of cake frosting or orange juice, but more recently the American Diabetes Association has advocated for the oral delivery of a nondiet, carbonated beverage. The carbonation helps to open both the esophageal and gastric sphincters allowing the liquid sugar quick access to the small intestine where it is rapidly absorbed to reverse this condition.

OHCPs should have a high index of suspicion in known diabetics who typically come to the office just before lunch or as the last appointment of the day. The signs and symptoms of hypoglycemia are listed in TABLE 3. For these reasons, OHCPs may benefit from having a glucometer in the office to accurately assess the glucose status of patients because many of these symptoms may simply mimic a well-sedated or even nervous patient. Using a glucometer, an accurate assessment can be made within 30 seconds. If the blood glucose is lower than 70 mg/dL, the patient should be administered 15 g of glucose (e.g., 4 ounces of a nondiet carbonated beverage or juice, three glucose tablets and one serving of glucose gel). After 15 minutes, the blood glucose should be tested again; additional glucose may be needed if it is still below 70 mg/dL or if symptoms of hypoglycemia persist. This treatment algorithm is typically described as the 15-15 rule. If the diabetic patient should lose consciousness, it is important to remember that nothing should be administered orally to an unconscious patient. If available, an intramuscular injection of glucagon can be administered to treat an unconscious diabetic patient suffering from severe hypoglycemia. If glucagon is not available, 911 should be called immediately.

If the diabetic patient should lose consciousness, it is important to remember that nothing should be administered orally to an unconscious patient.

Aromatic Ammonia (inhaled)

An example of an emergency medication that some OHCPs may currently be required to have available are smelling salts (ammonia inhalants) for the management of syncope. The use of ammonia inhalants is controversial due to the lack of safety and efficacy in addressing the underlying pathophysiology of the syncope. Regardless, ammonia inhalants remain part of many medical emergency kits in dental offices. The continued inclusion of aromatic ammonia in dental office medical emergency kits is an example of historical dogma that is changing in clinical and regulatory practice, and indeed there is a strong patient safety argument to be made for not exposing patients to this nonspecific respiratory irritant, especially because no drugs are typically needed to manage syncope.

The use of aromatic ammonia during suspected syncope can worsen the condition of a patient by potentially causing airway edema or infection, triggering acute asthma and increasing intracranial pressure. According to the Material Safety Data Sheet (MSDS), inhaled ammonia can cause a “burning pain in the mouth and throat, constriction of the throat and coughing followed by nausea, vomiting or diarrhea when inhaled.” Physical positioning of the patient followed by assessment of the airway, breathing and circulation may be more advised with activation of EMS/911 also being a consideration.

Conclusions

All dental offices must have a basic medical emergency kit stocked with equipment and medications appropriate to the age and population that the office treats. The contents of this kit must be able to address common urgencies and emergencies that may arise as a part of dental treatment or occur concurrently and randomly. It is vital that the entire team be vigilant in recognizing signs of patient distress and trained to take appropriate action when needed. Office preparedness involves inculcating all members of the office on a culture of safety that includes training in the recognition and management of medical emergencies, basic life support training, mock drills, prescribed individual responsibilities and stocking of appropriate equipment and emergency medications. Whether the basic medical emergency kit is commercially prepared or assembled piecemeal, the seven medications discussed in this article plus oxygen capable of being delivered under positive pressure must be available. Additionally, OHCPs must always verify state dental
board requirements for emergency drugs and equipment, possibly based on practice type or procedures delivered, if they exist.

Finally, all members of the dental team must remember two essential tenets for managing emergent situations in the dental setting: Emergency medical services should be contacted as soon as possible and the basic algorithm of PABCD, which outlines the process of supporting patients’ vital functions, should be followed until help arrives. Only after activating EMS and focusing on airway, breathing and circulation should the use of emergency drugs be considered based on a differential diagnosis. If needed, having the correct emergency drugs and knowing how and when to deliver them can further increase positive outcomes while continuing to make dentistry even safer. ■

NOTE
The views expressed in this manuscript are those of the authors and do not necessarily reflect those of Premier Dental Products Company, the Creighton University School of Dentistry or Vizient Inc.

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54. Keeley D. Everyone with asthma should have a metered dose inhaler and a spacer. BMJ 2018 Feb 15;361:k648. doi: 10.1136/bmj.k648.

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<table>
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<th>Location</th>
<th>Description</th>
<th>Details</th>
<th>Yearly Income</th>
<th>Property ID</th>
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<td>CULVER CITY</td>
<td>GP w/ 60 yrs of goodwill to offers is located in 2 story free standing bldg. Averaging 30 new patient/mo. Gроссed $365K in 2018.</td>
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<td>GRANDA HILLS</td>
<td>With 50 yrs of goodwill this general practice grossed approx. $328K in 2018. Low overhead.</td>
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<td>Rowland Heights</td>
<td>Estab. in 2009, this GP is located in a 1 story free standing bldg. Grossed $772K in 2018.</td>
<td>Property ID 5278.</td>
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<td>CARLSBAD</td>
<td>This beautiful practice has over 22 yrs of goodwill. Has 4 eq ops in a 1,800 sq ft suite. Fee for service office. Projecting approx. $440K for 2018.</td>
<td>Property ID #5256.</td>
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<td>CHULA VISTA (Turn-Key)</td>
<td>Well laid out practice in a 2 story med/dent building. Has 3 eq operators and 1 plumbed not eq. On a approx. 1,400 sq ft suite. Grossed approximately $588K in 2018. Great potential for a full time dentist.</td>
<td>Property ID #5273.</td>
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<tr>
<td>El Cajon - GP + Real State</td>
<td>Consists of 5 eq ops and equipped with 3D Sirona CBCT Digital X-ray. Grossing over $1M in the past 10 years.</td>
<td>Property ID #5265.</td>
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<td>Escondido</td>
<td>Turn-Key GP in single free standing building w/ 8 parking spaces. Seller is the landlord. Has 4 eq ops in approx. 2,400 sq ft office. Grossed approx. $312K in 2018.</td>
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<td>San Diego</td>
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<td>La Quinta</td>
<td>Well established GP with over 8 years of goodwill. This modern designed practice has 8 eq ops. On a the busiest major intersection. Projecting approx. $1.5M for 2018.</td>
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Avoid Medication-Related Tragedies With Comprehensive Health History Forms

TDIC Risk Management Staff

Take two of these and call me in the morning. That may have been sage advice a generation ago, but today, dispensing medication requires much more scrutiny. Americans are taking more prescription drugs than ever before, meaning health professionals, including dentists, must use extra precaution when dispensing and prescribing routine medications as part of an overall treatment plan.

The Dentists Insurance Company reminds dentists that the greatest ally in preventing negative drug interactions, allergic reactions or other adverse effects is a patient’s health history form. An accurate, up-to-date, comprehensive health history gives dental practitioners the data they need to make informed treatment recommendations — including those that incorporate medication or prescription-strength dental products.

Unfortunately, incomplete, outdated or missing health history forms can lead to tragedy. In one case reported to TDIC’s Risk Management Advice Line, an 11-year-old patient died after suffering an allergic reaction to a prescription-only toothpaste dispensed by the dentist. The patient had come in for a routine exam and teeth cleaning. The dentist noticed the presence of extensive decay throughout her mouth, so he dispensed a prescription-strength toothpaste to use at home. Two days later, the dentist learned the patient had suffered from anaphylactic shock and died.

The patient’s medical doctor alleged that the milk-based proteins in the toothpaste contributed to the patient’s death, as she had a lactose allergy. However, her parents had not disclosed the lactose allergy to the dentist at the time of the appointment. The patient had not been seen in five years and her previous health history could not be located after the practice transitioned to a digital record-keeping system.

Senior Risk Management Analyst Taiba Solaiman said this tragic case is a reminder that a patient (or a patient’s parent if the patient is a minor) should review, update and sign a health history form at every appointment. Dentists should then review the form prior to treatment. If the form is missing, a new form should be filled out and signed prior to initiating treatment.

“The patient’s signature serves as evidence that the information is current and the patient’s health was discussed,” Solaiman said.

Health history forms should contain questions about over-the-counter medications, prescribed medications and supplements, among others. TDIC provides sample health history forms in English and Spanish at tdicinsurance.com/sampleforms. Dentists should verify the information in the patient’s chart by speaking to the patient directly. Often, patients

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don’t recognize the link between overall health and oral health nor do they recall every medication they take, especially if they haven’t been seen recently. The following questions should be asked when updating a patient’s health history form:

■ Have you sought care from other health care providers since our last visit?
■ Have you visited the emergency room or been hospitalized since our last visit?
■ Have you begun, discontinued or changed the dosage of medications (prescribed or over-the-counter)?

A complete health history reveals crucial information about health conditions and medications that could affect dental treatment. It could also alert a dentist that dental treatment could affect a patient’s health condition.

Additionally, staff should immediately inform the dentist of any changes to a patient’s health. Attention to a patient’s medical and dental condition shows concern for their well-being and thus strengthens patient confidence in a dental practice’s treatment ability. If dentists are dispensing medication, it’s essential they are familiar with the medications (and products) they are dispensing and know the interactions, side effects and contraindications of each. Patients may not always be aware of the ingredients contained in dental products (such as milk proteins in a toothpaste), so the onus is on the dentist to educate them. For example, some dental products, such as prophy paste and fluoride gel, contain gluten and may cause a reaction to gluten-sensitive patients.

“Dentists should take dispensing and prescribing medication seriously,” Solaiman said. “Adverse reactions can and do occur and even something as seemingly benign as toothpaste can have a devastating outcome.” Typically, pharmacists advise patients of the possible side effects and contraindication of medications. In-office dispensing takes the pharmacist out of the review process. Before prescribing or dispensing any medication, dentists should review a patient’s current medications and existing medical conditions. They should review health history with the patient to identify known allergies and to avoid contraindications. This review process and discussion should then be documented and included in the patient’s record. Dentists should not rely on patients to determine whether they are allergic to a drug or a derivative of a drug. Rather, they should refer to the Prescribers’ Digital References at pdr.net or consult with the patient’s treating physician to ensure appropriate medications are prescribed.

“The more time you take to research medication, the less likely you will be called upon to defend your prescribing decisions and protect yourself from allegations of negligence,” Solaiman said.

Clear guidelines on dispensing should be established and staff should be educated on these guidelines. Dentists should also use caution not to dispense or prescribe medications beyond their scope of practice and instead consult with the patient’s physician. In addition, TDIC recommends adhering to the following health history guidelines:

■ If it has been two to three years since treatment, consider asking the patient to complete a new health history.
■ Obtain a new health history on minor patients once they turn 18.
■ Attach new forms to the old health history. Do not discard the previous health history.
■ Every two years, check with your local dental society or professional liability carrier for any required changes to the form.

Although adverse reactions to medication and dental products can and do happen, there are preventive measures to take to limit their occurrence. The most effective way to keep patients safe is by keeping thorough health history forms and holding open, face-to-face conversations with patients. Doing so gives dental practitioners the information they need to make the right treatment decision based on individual need.

TDIC’s Risk Management Advice Line is a benefit of CDA membership. If you need to schedule a confidential consultation with an experienced risk management analyst, visit tdicinsurance.com/RMconsult or call 800.733.0633.
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4233 SAN FRANCISCO GP Seller offering 26+ year general practice in SF Financial district. Ground floor office with high volume foot traffic. Approx. 1,200 sq. ft. facility with 4 fully-equipped ops. $930K+ avg. annual GR. Seller willing to help for a smooth transition.

4331 SAN FRANCISCO GP Downtown SF practice in gorgeous, remodeled 1,300 office with panoramic views. Suite includes 4 fully equipped ops, reception area, business office, private office, staff lounge, lab area, and sterilization area. Beautiful, modern cabinetry and equipment, 1,600 active patients with 15-20 new patients/mo. Owner/doctor works 3 days/wk with 5 hygiene days/wk. Average gross receipts $738K with average adj. net of $305K. Asking $495K.

4358 SAN MATEO GP Unique opportunity to own a downtown San Mateo GP surrounded by a variety of retail, restaurant, service and specialty shops generating significant foot traffic and daily business draw. 1,498 square foot facility with 4 ops, reception area, business office, private office, staff lounge, lab area, sterilization area, bathroom, storage & dedicated parking spaces. Family oriented practice with an emphasis on Restorative care. Average annual Gross Receipts $400K+.

4336 SAN BRUNO GP Legacy practice centrally located in a combined commercial & residential neighborhood, convenient to highways 101, 280, and 380 and close to the BART station. Elegant, remodeled 1,463 sq. ft. office with 5 fully-equipped ops. & digital radiography. 5 year average Gross Receipts $922K+. 1,000 active patients with an average of 10 new patients per month. Asking $661K.

4216 SIERRA NEVADA FOOTHILLS 23 year practice located in the heart of the Sierran foothills in modern building close to downtown area. 1,024 square foot office with 4 fully-equipped operatories, upgraded major equipment and digital radiography. Average Gross Receipts $890K+ with 56% average overhead. Asking price for practice $604K. Seller is offering real estate for sale to the buyer of his practice.

4262 MOUNTAIN VIEW GP Desirable 1,700 square foot Mountain View location. 5 fully equipped operatories. Average Gross Receipts $886K+ with 4 doctor days and 6 hygiene days. Practice with an emphasis on Restorative and Preventative care. Seller retiring. Great opportunity for a skilled dentist to take over a 35 year practice with seasoned staff and loyal patient base. Asking $619K.

COMING SOON: SF GP, Santa Clara GP, Napa County GP & Monterey County GP
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Security Incident Response Procedures

CDA Practice Support

Incidents of ransomware and email phishing have significantly increased in the last two years, according to regulators and industry analysts, and U.S. Department of Health and Human Services Office for Civil Rights investigations have identified misconfigured information systems as a cause of some data breaches. In order to limit the impact of cyberthreats and for emergency preparedness, regulators require and security experts urge HIPAA-covered entities, such as dental practices, to have written procedures for detecting and responding to security incidents. A “security incident,” as it relates to electronic protected health information, is defined as “the attempted or successful unauthorized access, use, disclosure, modification or destruction of information or interference with system operations in an information system.”

Security incidents include but are not limited to:
- Theft, attempted theft or loss of a server or device with electronic protected health information (ePHI).
- Unauthorized use of or access to the dental practice information system, software or data, for example, failure to terminate the account of a former employee.
- Unauthorized or accidental disclosure of ePHI, for example, email with an incorrect address.
- Attempts, failed or successful, to access the dental practice information system, software or data without authorization.
- Virus or malware infection/attack, for example, a phishing email.
- Denial-of-service attack.
- Unauthorized access to area where the server and other computer hardware are located.

Regulators require and security experts urge HIPAA-covered entities, such as dental practices, to have written procedures for detecting and responding to security incidents.

- Compromised user accounts, for example, staff sharing the same password to the practice management system.
- All staff should be trained to identify security incidents, such as phishing attempts and slow computer processing, and to report them as soon as possible to the dental practice security officer. The security officer must also ensure the dental practice has a procedure to regularly review information system activity in order to detect other security incidents. Information systems can be configured to automatically generate certain reports such as access, software updates and system errors. Client/server networks offer more controls than a network of computers. There is no recommendation for the scope and frequency of reviewing such reports so a dentist can determine their own level of vigilance. A dentist may want to review some reports, such as failed login attempts or business associate access, more often than others. The dental practice’s IT advisor can be consulted for recommendations on scope and frequency of review. All security incidents should be logged, even if a security incident is assessed not to be a breach.

The security officer is responsible for initiating the dental practice’s response to such incidents. The security officer must:

Assess the security incident. Each incident should be assessed in terms of risk and impact in order to determine next steps. At a minimum, a low-risk, no-impact incident such as a single failed access attempt simply would be documented. However, if the number of failed access attempts is much higher than usual, then the risk level increases and further investigation and other steps would be warranted. An example of an impactful incident would be ransomware infecting an information system with no viable data backup. With a loss of access to ePHI, the security incident would be assessed to be a breach that the dental practice would have to report.

Identify who must be notified about the incident. The security officer will bring in or consult with individuals as needed. Many security incidents may require evaluation by a professional IT support person or company. A dental practice should retain a professional IT support person or company in order to assist the practice in both preventing security incidents and responding to them. Local law enforcement and/or the FBI should be contacted if there appears to be criminal activity, for example, with the theft of a server or laptop or the use of ransomware. If a dental practice has cyber coverage and it is clear that data was lost or stolen through hacking or ransomware, the insurance carrier should be contacted. A breach of ePHI requires notification of patients, the Office for Civil Rights (OCR), the state attorney general and possibly local media, and the security officer should work with the dental practice’s privacy officer to complete appropriate breach notification procedures. Breaches of information of 500 or more individuals must be reported to those affected and to the OCR within 60 days of discovering the breach, even if the incident continues to be investigated.
Contain, eradicate and recover. The security officer will work with the individuals identified above to limit the impact of the security incident and to recover ePHI to the extent possible. Examples of actions that may be taken include checking backups to ensure they are free from virus or malware and taking a server offline and replacing it.

Review post-incident procedures. Once the immediate needs of managing a security incident are finished, the security officer should work with the individuals identified above to assess how and why the incident occurred and to identify procedures, if any, to prevent repeat occurrence of the incident. Examples of actions that may be taken include disciplining one or more employees or terminating their employment, changing data backup protocol and upgrading equipment and software.

REFERENCES

Regulatory Compliance appears monthly and features resources about laws that impact dental practices. Visit cda.org/practicesupport for more than 600 practice support resources, including practice management, employment practices, dental benefits plans and regulatory compliance.
6163 LAKEPORT Extremely attractive alternative to practicing in ultra-competitive urban settings and living in expensive housing markets. Appeal of practicing in Lakeport is ability to step back in time when life was less hectic. Decompress and have more time for yourself. Practice has 44-year foundation. Beautiful 6-op facility with high-end technology, inhouse fabrication center and completely networked. 2018 collected $596,000 with Profits of $360,000. Building is optional purchase. Full Price $350,000.

6149 REDDING Great alternative to practicing in uber-competitive markets located in ultra-expensive housing communities. Strong foundation as evidenced by 1,500+ patients and growing Hygiene Schedule which is now 8-days a week. Charges in 2018 totaled $709,800 - down from 2017 which realized $779,000. (2018 experienced a hiccup due to the Carr Fire in July.) Owner works 3.5 day week and takes 9-weeks off. Simple “bread & butter” practice with all specialty Specialists in the Sale and Appraisal of Dental Practices
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PRACTICE #1 Unique opportunity for Ambitious Successor. Roll up sleeves and improve performance in absentee-owned practice. 30,000 charts, 100 new patients/month. Work four 10-hour days. Net $800,000.

PRACTICE #2 Grossing $1,500,000 and Nets $500,000. Great location. Take to $2,000,000.

DSO can acquire both practices and increase Net by $1,000,000.

ALTA LOMA Great Shopping Center, 5-Ops, will do $1 Million.

BAKERSFIELD Union Practice with building. Grosses $650,000.

BAKERSFIELD AREA Grosses $40,000/month. 1,800 sq.ft. building $330,000.

CAPISTRANO BEACH Low overhead. Grosses $200,000 16 hours/week. By taking Denti-Cal, increase to $500,000. Will net $250,000 with Denti-Cal. Full Price $165,000.

DIAMOND BAR Fantastic Shopping Center Location. 5-ops. Full Price $150,000.

GLENDALE/BURBANK Absentee owned. Absolutely gorgeous free standing building. Real estate also available. Grosses $840,000. 5 Ops. $300,000 in recent upgrades. Full Price $750,000.

HEMET Super Bargain. Assume mortgage. 3,500 sq.ft. building. 5-ops. Absentee owned. Full price $65,000.

INLAND EMPIRE Union Practice can do $1,000,000. Averages 50 new patients per month. Low rent.

INLAND EMPIRE Alongside freeway, high identity location. $10,000/month HMO income. 7-ops, low rent. Grosses $500,000. Should be doing $1,000,000. Full Price $485,000.

IRVINE GP with small children will sell and work back or share with Dentist. Grosses $1 Million.

LA HABRA Large mall. 6-ops. Female DDS does not want to own, will work back. Needs marketing. 1,600 sq.ft. Full Price $270,000.

ORANGE COUNTY BEACH CITY Buyer will do $1.5 Million first year. Special circumstances makes this a Super Purchase. 1,800 sq.ft., 4-ops, Cone Beam. Rent only $3,600. Seller will work back 1+ year. HMO checks shall pay rent. This is a fantastic buy! Full Price $850,000.

PALM SPRINGS AREA All High Identity, all grossing near or over $1,000,000 – all First Cabin.

REDLANDS Established 25-years, 5-Ops. Did $600,000 in past. Needs hands on Owner.

SAN GABRIEL / PASADENA Seller lost Lease. Grossing $1,400,000. Seller will work back 2+ years. 10 days of Hygiene/Week.

SAN GABRIEL PEDO Losing Lease. 35-years. 3,500-to-5,000 families.

SANTA CLARITA Location, Location, Location. 2,600 sq.ft., 10-Ops. 3 Tenant Dentist will pay rent free to Buyer. 50-to-70,000 auto pass per day $250,000

SANTA CLARITA Shopping center. Share 5-ops. Full Price $50,000

VENTURA Established 20-years. $10,000/month HMO. Grossing $1,800,000.

WEST COVINA Absentee owned. Grosses $650,000. Beautiful 3-op office.
BAY AREA

AC-886 SAN FRANCISCO (Facility): Unsurpassed visibility & location! Potential here is limitless! 850 sf w/ 3 ops $85k
AC-989 SAN FRANCISCO (Facility): Busy Retail Shopping Plaza w/ major anchor tenants! 3 ops $125k
AG-871 SAN FRANCISCO: Seller Motivated! 600 sf w/ 2 ops Price Reduced $65k
AG-944 SAN FRANCISCO: 980 sf w/ 3 ops $95k
AG-945 SOUTH SAN FRANCISCO: Be a part of this vibrant, diverse population. 1800 sf w/ 4 ops $495k
AG-950 SAN FRANCISCO: Build the practice of your dreams! 850 sf w/ 3 ops $228k
AG-993 WEST PORTAL AREA: Desirable area w/ easy commute to downtown San Francisco. 1000sf w/ 3 ops $450k
AG-994 SAN FRANCISCO: Highly profitable with net profit over $400k! 850 sf w/ 3 Ops $825k
AN-947 DALY CITY: Seller Motivated! Great curb appeal and visibility! 1500sf w/ 4 ops. $375k
AN-1011 SAN FRANCISCO Facility: Don’t pass up this remarkable opportunity! Perfect for Speciallists! 604 sf w/ 2 ops $65k
BC-741 DANVILLE (FACILITY): Move in Ready! ~ 1600 sf w/ 3 ops. PRICED TO SELL! $10k
BC-926 ANTIQUE: Long established, well respected office. 1866 sf w/ 5 ops $495k
BC-949 ALBANY: Desirable commercial/residential area. Medical Prof Bldg w/ good frontage. 3200sf w/ 4 ops $695k Real Estate: $1.8
BC-1010 ANTIQUE: Amazing Opportunity in Health Prof. Complex 2118 sf w/ 2 equipped ops + 3 add’l $250k
BC-1015 SAN RAMON Facility: Fantastic location, beautiful buildouts and well equipped, move in ready office! $200k
BG-925 HAYWARD: Profits close to $900k per year! ~ 1930 sf w/ 6 ops $1.15M
BG-981 BERKELEY: Long established, family-oriented practice. 1100 sf w/ 3 Ops $345k/ Real Estate Available $499k
BN-891 PINOLE: This seller is ready to retire, & looking for someone to continue the legacy! 1300 sf w/3 ops. $350k
BN-943 MCMINNVILLE: Opportunities like this only comes along every great once in a while. 1520sf w/ 4 ops +1 add’l! $450k
BN-952 BERKELEY: Step into this quality practice and you’ll know you belong here! ~ 835 sf w/ 3 Ops. Reduced Price $375k
CC-846 SAN RAFAEL: Prof/Retail Building Complex. 3 ops 640 sf Collections $433k in 2017 ~ $275k

BAY AREA CONTINUED

CC-927 SAN RAFAEL: Build the practice of your dreams by increasing this 2-day work week! 800 sf w/ 3 ops $199k
CC-960 SONOMA: Great location in one-of-a-kind setting! 950 sf w/ 3 ops. $385k/ Real Estate $350k
CC-979 NOVATO: Seller Retiring. 803 sf w/ 3 ops near downtown and Old Town Novato. $195k
(Rel Estate $215k)
CC-1011 VACAVILLE: Maximize your work days and watch your production increase! ~ 1500 sf w/ 4 ops $125k
CG-616 NAPA COUNTY: State-of-the-Art office! ~850 sf w/ 2 Ops. Seller Motivated $250k
CG-995 VALLEJO: Live, play and practice here where your lifestyle can’t be beat! 2035 sf w/ 7 ops $1.175M
CN-911 SANTA ROSA: “Quality Care & Patient well-being FIRST”. 2250 sf w/4 ops + 1add’l. $545k
DC-984 SUNNYVALE: Near Apple, Google & Microsoft. 965 sf & 3 ops $185k
DG-862 MID-PENINSULA: Rare gem with up to 7 operating rooms in the Bay Area!! 2274 sf w/ 6ops + 1 add’l. $475k
DG-936 SUNNYVALE: Opportunity of a lifetime! ~1000 sf w/ 3 ops. $495k
DG-978 PALO ALTO: Imagine the possibilities with the newly opened Amazon corporate office nearby! $455k
DG-986 CAMPBELL: The ideal opportunity to practice in this community! 988 sf w/ 3 ops $325k
DG-1006 MONTEREY AREA: This practice is one which every dentist aspires to! ~3400sf w/ 8 ops $1.395M
DG-1009 MONTEREY BAY AREA: Don’t hesitate! 1150sf w/4 ops $725k
DG-1014 MONTEREY: Don’t miss your opportunity to live and practice in beautiful Monterey! 11125 sf w/ 4 Ops. $875k
DN-898 SAN JOSE: Built-out 2015 w/ location, visibility, convenience in mind! 2,204 sf w/4ops + 2 add’l. $500k
DN-937 SAN JOSE: This opportunity is waiting for your talent & skills! 2210 sf w/ 4 Ops + 2 add’l. $500k
DN-928 CASTRO VALLEY: Continue the tradition of delivering quality dental care! 883 sf w/ 3 Ops. $275k
DN-1004 REDWOOD CITY: On Track to Exceed $800k in Revenues for Current Fiscal Year! 1,150 sf w/ 4ops. $545k
DN-1003 PLEASANTON Facility: This amazing turn-key facility is an excellent opportunity! 1,000 sf w/ 3ops. $75k

Top 10 Issues for Dentists Contemplating Retirement In Ten Years or Less

Top Ten Issues For Your Life's Work Comes Down To This Decision

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Top 10 Issues For Dentists Contemplating Retirement In Ten Years or Less

all or email today for a free copy of Dr Giroux’s book
NORTHERN CALIFORNIA

FC-1005 YOLO CO: Highly Successful w/ Great Reputation in the Community! 1239 sf w/ 3 fully equipped ops $720k
EG-910 MIDTOWN SACRAMENTO: Unlimited Potential! ~ 1107 sf w/ 2 ops + 1 add'l. $210k/Real Estate $395k
EG-965 SOUTH AUBURN VICINITY: The ideal opportunity to practice in this community! ~1100 sf w/ 4 Ops. $350k
EG-968 SACRAMENTO: Desirable, mid-town neighborhood, w/ ample parking in garage! ~1527 sf w/ 5 Ops. $550k
EG-1012 EAST SACRAMENTO: A practice like this one does not come available very often! ~ 2900 sf w/ 8 ops. $2.5M
EG-1016 LINCOLN: Look no further than this growing community to springboard into your success! 1800 sf w/ 4 Ops $595k
EN-976 SACRAMENTO: Philosophy to treat patients like family & listen to their needs. 1750sf w/3ops. $595k
FC-650 FORT BRAGG: Family-oriented practice. 5 ops in 2000 sf $350k for the Practice & $40k for the Real Estate
FC-962 HEALDSBURG: Known as 1 of top 10 small cities in the US! Amazing practice w/ 1200 sf & 3 ops. Beautifully landscaped professional plaza $180k
FG-841 ARCATA: Great demographics w/ very little competition! 1114 sf w/3 ops Reduced Price: $200k/ Real Estate Available
FN-961 EUREKA: Where the quality of life can’t be beat! 1400sf w. 4 ops. $350k/Real Estate Available $395k
FN-855 NO. HUMBOLDT: Seller relocating! Long-established, 100% FFS practice! 1600 sf w/3ops + 1 add’l. $190k/ Real Estate Available
GN-953 CHICO: Established for 55 years and the seller is passing their goodwill on to you! 1067sf w/3ops. $315k
GN-924 TEHAMA COUNTY: Don’t miss this ideal opportunity! 3000 sf w/ 6 ops. Practice $495k / Real Estate $455k
GN-988 YUBA CITY: Excellent Merger Opportunity! Location and Lifestyle! 1,600 sf w/3ops. $100K
HG-815 TRUCKEE AREA: Busy, productive practice with 3 days of hygiene! 1000 sf w/3 ops $165k / Real Estate $437k
HG-851 SO LAKE TAHOE: Projected Revenue on track to do just under $700k this year! 2100 sf w/5 ops $425k
HG-983 GRASS VALLEY: Newly remodeled office in highly desirable neighborhood! ~1250 sf w/ 3 ops. Reduced Price $195k/Real Estate Available
HN-618 SIERRA FOOTHILLS: Seller Retiring! Huge opportunity for growth by increasing office hours! 750 sf w/ 2 ops $65k
HN-740 SHASTA CO: Beautiful mountain community, well-established practice, exceptional long-term staff. 2400 sf w/5 ops + 1 add’l. $475k/ Real Estate $350k
HN-773 SUTTER CREEK: Qualified & credentialed Seller willing to show you how! 1536 sf w/4 ops + 1 add’l. Only $95k! Real Estate Available
HN-879 SONORA: Great Cash-Flow for Only 3 Days a Week! 2950 sf w/ 3 ops Reduced Price: $265k
HG-934 GRASS VALLEY: Just imagine living and practicing here! ~1200 sf w/ 3 Ops $225k/Real Estate $190k
HN-941 GOLD COUNTRY/CALEVARAS CO: This is the right practice for you! 2300sf w/2ops + 3 add’l! $175k
HN-999 CALAVERAS Co. (Facility/Real Estate): 1,500 sf w/ 2 equipped Ops + 1 fully plumbed & 3 partially plumbed. $500k

NORTHERN CALIFORNIA CONTINUED

HN-991 PLACERVILLE: Quality, conservative and compassionate practice! Will consider work back. 1,654 + 473 sf w 5 ops. $675k

CENTRAL VALLEY & SOUTHERN CALIFORNIA

IC-975 MODESTO: Established 33 years. 1,100 sf w/ 3 ops $225k
IG-832 OAKHURST: 2048 sf w/3 ops + 1 add’l. $235k/ Real Estate $375k
IG-881 TURLOCK: ~3500 sf w/ 10 Ops (shared). $360k
IG-1007 GREATER MODESTO AREA: Combines a quality learning environment with relaxed rural living. 3000sf w/ 6 ops. $645k
IN-764 STOCKTON: 5,000 sf w/10 ops. $220k
IN-917 MERCED AREA: Well established practice with a stable, loyal patient base! 1300 sf w/ 3 Ops. Reduced! $295k
JC-811 FRESNO COUNTY: Seller willing to consider Associateship for qualified DDS w. intention to Buy in! 3,000 sf w/ 6 ops $350k
JC-823 LOS BANCOS: Heavy emphasis on hygiene. 1000 sf w/ 3 ops $80k
KL-909 SAN DIEGO: Remarkable Opportunity. Long established in vibrant North Park. 2400 sf w/ 5 ops & 2 Peds chairs $810k
KJ-921 SANTA MARIA: Live and practice in this desirable collegiate coastal community! 930 sf w/3 ops Seller Motivated $285k
KL-955 SAN DIEGO: Just Listed! Well established & centrally located in 1st floor suite w/easy freeway access. Adjacent vacant suite available for expansion. $225k

SPECIALTY PRACTICES

BC-784 CENTRAL CONTRA COSTA CO Perio: Seasoned Staff. Office runs like well-oiled machine! 3 ops $295k
BG-843 WALNUT CREEK Perio: Great gross and profit for only 2 ½ days per week! 1085 sf w/ 4 ops $390k
BN-998 WALNUT CREEK/SAN RAMON AREA Ortho: Looking for your dream Orthodontic practice! 1450 sf w/5 Open bays/Chairs. $1.150M
DC-835 TRI-VALLEY Perio: Collections over $1.2M. 2,100 sf $800k
DN-908 SAN JOSE Pedo: Amazing Location! Providing affordable pediatric dentistry to families! 3600 sf w/4ops + 3 add’l. $175k
DN-959 APTOS Perio: Highly successful at this proven location! 1350sf w/ 4op. Reduced $675k / Real Estate Available $650k
EG-903 CARMICHAEL Oral Surgery: Gross receipts were over $1.1 million in 2017! Stable patient base won’t be affected by transition! 2282 sf w/ 5 ops
Amazingly Priced: $450k
GG-940 NORTH OF SACRAMENTO Peds: Practice is on track to collect more than $1M in revenues this year! 4300 sf w/ 5 ops. Reduced $650k
JG-757 VISALIA Perio: 9 Hygiene days per week, this practice is a rare gem! ~ 2,600 sf w/ 5 ops Steal at $335k

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

Anker PowerCore Fusion, 5000mAH
($25, Anker)

Whether traveling for business or pleasure, consolidation of baggage is a welcomed thing. Mobile devices themselves take the place of many devices (e.g., computers, GPSs, cameras and phones to name a few) and are must-have items for travelers. Keeping these devices powered becomes paramount, which is why mobile charging stations, accessible wall outlets and power bank (or external mobile device batteries) vending machines have become ubiquitous at major travel hubs. Still, a portable battery remains essential for those moments when none of these modern conveniences are accessible. The Anker PowerCore Fusion, a two-in-one wall charger and power bank, is a product made for the modern traveler.

Anker is a China-based company founded in 2011, and it has attained worldwide reach by being one of the first major mobile device peripheral companies to embrace Amazon. Introduced in 2017, the PowerCore Fusion is one of Amazon’s most popular products because of its compact versatility and simplicity. Despite being only slightly thicker than a deck of cards, this device has two USB ports and a flip-out wall plug. On its own, the PowerCore Fusion acts as a power bank that has enough energy to fully charge any mobile phone or halfway charge any tablet. Plug it into the wall and not only will it replenish its own battery, it will also pass the charge on to two devices plugged into it. A blue LED light indicates the PowerCore’s own battery levels and Anker’s MultiProtect system automatically protects devices (and itself) from damaging power surges. The entire device has one button to check the battery, making it extremely user-friendly.

Having a two-in-one gadget that serves all the mobile device power needs is a great boon to travelers, and at its price point makes it a must-have for anyone on the go.

— Alexander Lee, DMD

mobilePDR
(Free, PDR Network)

Many dental offices have traditionally used a physical copy of The Physician’s Desk Reference (PDR) as a tool to look up and compare drug information and interactions in the medical assessment of patients prior to dental treatment. The final hardcover edition was printed in 2017. The PDR continues to be updated online weekly and can be referenced either on the web or through the mobilePDR app, available for iOS or Android devices.

MobilePDR requires an account registration, which is free for all U.S. health care professionals. Once logged in, users are welcomed with a simple home screen containing an entry field where providers can search for drugs by brand or generic name or pharmacologic class. Selecting a drug from the list displays its comprehensive information sorted by pertinent categories. Users can tap on the “Compare” button on any drug to add it to a selection list. Users can subsequently tap “View Comparison” to see information between two or more selected drugs side by side by swiping left or right between drugs. Comparison lists can be saved for future use. An Interaction Checker is included, where users can add two or more drugs and find possible contraindications based on minor, moderate or major severity. Another useful feature when patients do not know what drug they are taking is Pill ID, where providers can search for a drug based on its imprint, shape, color and score qualities. Any drug can be saved for frequent reference on the home screen via the Share Sheets button.

With its reputation as a trusted drug reference for health care providers, mobilePDR is a simple implementation of this useful product for mobile devices. Featuring its simple search and quick cross-referencing features, this tool will help equip providers in dental offices with the information they need to make important health assessments for their patients prior to dental treatment.

— Hubert Chan, DDS

Would you like to write about technology?
Dentists interested in contributing to this section should contact Andrea LaMattina, CDE, at andrea.lamattina@cda.org.
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