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Aliens Among Us
Kerry K. Carney, DDS, CDE

When I was growing up, there were two popular science fiction series: “The Twilight Zone” and “Outer Limits.” They both aimed to scare the beeegeebies out of the viewer. “Outer Limits” relied on the hideous monster-of-the-week theme. “The Twilight Zone” was more subtle and much scarier. It relied on placing every story in an everyday setting with everyday characters who slowly were revealed to be somehow alien. It was that “aliens among us” aspect that was so effective and unsettling.

Now there are new aliens among us. They may look like us, but they are very different. They are the millennials.

It seems that every meeting I attend has an authority that expounds on the unique characteristics of that generation of individuals born between 1980 and 2000. It is not the amusing anecdotes about how millennials incorporate new technology into their lives; it is the undercurrent of strangeness, of foreignness attributed to them that makes me uncomfortable.

When I see charts that tell me how profoundly different millennials are and how the baby-boom generation must learn a new language to speak to them, I become annoyed.

Most generational comparisons seem fatally flawed. They compare groups of people across age ranges. They are based on the assumption that we do not change in our behavior or beliefs as we age. But we do change.

When I reread a book or review a film I first experienced as a young adult, I seldom have the same appreciation the second time around. I perceive it later through the lenses of my experience. The first time I saw “The Graduate” I empathized with Benjamin Braddock. Years later, on review, I empathized with Elaine Robinson’s father. The movie did not change. I had changed.

Time even changes how we experience language. Now, as a homeowner, I can appreciate the phrase “get off my property,” in a much different way than I did years ago as a child when a grouchy (my perception then) neighbor used the phrase to advise my playmates and me it was time to exit her yard. Our perceptions are fluid over time.

My uncle told me years ago that he had feared my siblings and I would never learn to read or appreciate the written word. He was from a time before electricity in the home. As a child, he had read his books by the light of an oil lamp. He was sure that because we spent so much time in front of the television set, my generation would be intellectually stunted and never able to enjoy literature like he did.

Our childhoods were very different, but it might have been interesting if my uncle and I could have tampered with the time continuum and met as young adults. We would not have been “contemporaries,” but we would have both been standing in the same section of the river of our lives. We might have shared a common perspective. We might have found we had many of the same motivators. We might have agreed on what makes a person good.

The baby boomers were subjected to the same kind of alienating criticisms when they were the “new generation.” The lyrics in a popular musical of the 1960s characterized boomers as disobedient, disrespectful, noisy, crazy, sloppy, lazy loafers. They went on to describe the cohort’s inability to live up to our parents’ generational expectations, with the plaintive questions: “Why can’t they be like we were, perfect in every way? What’s the matter with kids today?”

I agree with George Orwell when he noted that, “Every generation imagines itself to be more intelligent than the one that went before it, and wiser than the one that comes after it.”

Wisdom can flow in both directions. The trick is to not overemphasize the differences and to continue to learn from one another. The process of maturation requires modifying opinions and perceptions based...
on experience and information. Maybe our goal should be to try to appreciate some of the wisdom that millennials have distilled from their unique experience and perspective.

Millennials are different. The experiences of their childhood are as distant and different from mine as those of my uncle’s oil-lamp-lit childhood. But I think we have more in common with millennials than many would lead us to believe. Yes, they grew up in a different world, but they are not aliens. They are like us … but younger.

The Journal welcomes letters
We reserve the right to edit all communications. Letters should discuss an item published in the Journal within the last two months or matters of general interest to our readership. Letters must be no more than 500 words and cite no more than five references. No illustrations will be accepted. Letters should be submitted at editorialmanager.com/caldentassoc. By sending the letter, the author certifies that neither the letter nor one with substantially similar content under the writer’s authorship has been published or is being considered for publication elsewhere, and the author acknowledges and agrees that the letter and all rights with regard to the letter become the property of CDA.
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800.232.7645 or cda.org/practicesupport
Brands and Independent Contractors

David W. Chambers, EdM, MBA, PhD

Brands have value. That is certainly so for dentistry, where there are 120 practices with fictitious business names in San Francisco. That is part of the idea behind “corporate” dental practices.

The modern corporate business structure is a marvel because it permits segmentation and separate ownership of various aspects of the customer experience. The most successful limited liability corporations own the controlling and most profitable aspects of the enterprise and sell off the rest to independent contractors.

Ethics is one of those business assets or liabilities that can be spun off to maximize profit. Responsibility for fixing mistakes can be sold to others as easily as offering extended warranties or subcontracting with other outfits that are willing to buy one's boo-boos under their name. Companies can actually sell their ethical liabilities. Read the fine print.

The current masters are in Big Pharma. Consider “pay to delay” drug marketing settlements. A large firm faces revenue losses as its patent is about to expire and a startup readies to introduce a generic alternative. The business with a brand threatens a costly legal action, which has little chance of prevailing in court but would consume most of the small firm's resources and some taxpayers' funding of our justice system. Constraint of trade is dodged by reaching a court settlement where the generic manufacturer agrees to delay introduction of the competitive product for a period, say seven years, in exchange for several millions in cash payments from the larger firm each year. Both companies and their lawyers come out ahead, but at the expense of the public.

Specific case: The pharmaceutical company Aventis was making little from an anti-inflammatory orphan drug called Acthar, charging only $50 per vile. Protecting its brand image, it was afraid to raise prices out of fear of acquiring a reputation for price gouging. Aventis slithered out from under this ethical limitation by selling the patent to Questcor, evidently an outfit with no reputation to protect, for a nominal $100,000 plus a percentage on all future sales. A single dose of Acthar now costs $28,000. Aventis sold its ethical responsibility and got another company to do its dirty work.

Here is another trick where a company with a brand uses an entity with a weak reputation to extract money from the public. Insurance companies derive income from copayments on expensive brand-name drugs that they cannot get from the less expensive generics. Some manufacturers now offer to reimburse patients the copayment for continuing to buy their brand-name pills. Customers come out ahead. Manufacturers have to pay the insurance company a few bucks, but they are able to retain the much larger profit margin while using the insurance company to collect from employers and the government that underwrite the insurance contracts. Could happen in dentistry.
Children’s Oral Health Disparities Persist Despite Equal Dental Care Access

Oral health of children who receive dental care through Medicaid lags behind that of their privately insured peers although the children receive the same amount of dental care, according to a Columbia University College of Dental Medicine study published in Health Affairs in December.

The study considered data from the 2011–2012 National Survey of Children’s Health, which included parent reports of oral health and use of dental care for 79,815 children and adolescents (ages 1 to 17 years) of all social levels. No differences were found between Medicaid-insured and commercially insured children in the odds of their having a dental visit, preventive or otherwise.

However, parents of children enrolled in Medicaid were 25 percent more likely to report that their children did not have an “excellent or very good” dental condition and 21 percent more likely to report that their children had dental problems within the last year than were parents of commercially insured children.

Burton L. Edelstein, DDS, MPH, chair of the section of population oral health, professor of dental medicine at the College of Dental Medicine and professor of health policy and management at Columbia’s Mailman School of Public Health, was the lead author of the study.

“We can’t segregate oral health from overall health,” he said. “Evolving health systems that bring teams of providers together to promote healthy behaviors can address common risk factors that benefit a child’s overall and oral health. But if you segregate dentistry, especially for Medicaid kids, then you lose that opportunity.”

To learn more about the study, go to healthaffairs.org.

Abnormal Salivary Glands Linked to Cleft Lip, Palate Dental Problems

A new study in the Journal of Dental Research suggests that dental problems associated with cleft lip and palate may be caused by abnormalities in salivary glands and an imbalance of immune compounds in the mouth.

Timothy Cox, PhD, a craniofacial researcher at Seattle Children’s Research Institute and lead author, found that mice with a gene mutation that causes cleft lip and palate had problems in their salivary glands that affected gum tissue and oral health.

“We found that the cleft lip and palate gene mutation also resulted in abnormal salivary glands,” Cox said. “The result was a mouth environment that was too acidic and contained excess bacteria, which led to problems in the gums and more rapid tooth decay.”

In the study, the researchers offered mice with the cleft lip and palate mutation and mice without the mutation a high-sugar diet. After just eight weeks on this diet, the mice with the cleft lip and palate mutation had almost no molar teeth left, while the mice without the mutation had only mild decay.

The researchers focused on the gene IRF6, which is most commonly associated with cleft lip or palate. Many other genes have been linked to cleft lip or palate, and the researchers hope to understand if these additional genes are also associated with enhanced tooth decay.

“We hope that as the research progresses, doctors and dentists can apply the findings in caring for cleft lip or palate patients and protect their teeth starting in early childhood and into adulthood,” Cox said.

For more on the study, go to journals.sagepub.com/doi/full/10.1177/0022034516679376.
Study Estimates Health Impact of UK Soft Drinks Levy

A soft drink levy set to be introduced in the United Kingdom in April 2018 could have a significant impact on the dental health of people of all ages, but especially children, according to a study published in The Lancet Public Health. The study was the first to estimate the health impact of the proposed soft drinks industry levy, which calls for no tax on diet and low-sugar drinks, a low tax on mid-sugar drinks and a high tax on high-sugar drinks. In the study, researchers modeled three ways that the soft drinks industry might respond to the levy: reformulating drinks to reduce sugar content, passing some of the levy to consumers by raising the price of sugary drinks and using marketing to encourage consumers to switch to lower-sugar drinks. For each response they identified a realistic best- and worst-case scenario for health, by estimating the likely impact on rates of obesity, diabetes and tooth decay.

The study finds that an industry response that focuses on reducing sugar content is likely to have the greatest impact on health. Researchers estimate that a reduction of 30 percent in the sugar content of all high-sugar drinks and a 15 percent reduction in mid-sugar drinks could result in 144,000 fewer adults and children with obesity, 19,000 fewer cases of type 2 diabetes per year and 269,000 fewer teeth suffering from decay annually.

Adam Briggs, MFPH, of the University of Oxford and lead author of the study, said research suggests that the most likely industry responses to the tax have the potential to improve overall health. “The extent of the health benefits of the tax will depend on industry’s response,” Briggs said. “We must therefore be vigilant to ensure the food industry acts to remove sugar from soft drinks, and that where the tax is passed on to consumers, it increases the price of targeted products only — drinks with high levels of sugar.”

To learn more about this study, see The Lancet, vol. 2, no. 1 e15-e22 January 2017.

Impact of NIH Research Funding to Dental Schools

Articles published recently by the International and American Associations for Dental Research (IADR/AADR) in the Journal of Dental Research shed light on the trends and impact of National Institutes of Health research funding to dental schools and institutions.

A study titled “The NIH’s Funding to U.S. Dental Institutions from 2005 to 2014” by researchers at the National Institute of Dental and Craniofacial Research (NIDCR) examined NIH’s investment in both extramural research projects and training at dental institutions. Over the 10-year span, 56 U.S. dental institutions received approximately $2.2 billion from more than 20 institutes, centers and offices at the NIH, according to the study. The NIDCR is the largest NIH supporter of dental institutions, having invested 70 percent of the NIH total, about $1.5 billion. The NIDCR is also the primary supporter of research training and career development.

“Recent Trends in Oral Cavity Cancer Research Support in the United States” by researchers from Wayne State University, Michigan, University of Pittsburgh and Medical University of South Carolina found that overall funding for oral cavity cancer research decreased considerably after 2009. Funding administered through the NIDCR was 6.5 times greater than dollars awarded by the NIH National Cancer Institute (NCI) in 2000; over the time period evaluated, NIDCR support decreased in most years while NCI support increased and approached NIDCR funding levels.

“AADR will continue to communicate to Congress the importance of biomedical research for the health of the population,” said AADR President Jack Ferracane.

To read the full articles, visit sagepub.com/toc/jdrb/current.
Fossilized Teeth Reveal Much About Ancestors


Guatelli-Steinberg, a professor of anthropology at The Ohio State University, said modern humans have teeth that were adapted for eating a very different diet than the one currently enjoyed by most Western societies. In the book, she notes that 99 percent of humans’ evolutionary history was spent eating foods that were hunted or gathered, much unlike current diets of soft, processed and sugary foods.

“Problems like cavities and plaque buildup have been magnified tremendously in humans today,” she said. “Natural selection has not prepared us well for the kinds of food we eat today.”

In addition to having much higher rates of cavities and plaque, modern humans are much more likely to have misaligned teeth that require orthodontic treatment or surgery. “Soft diets do not stimulate jaw growth, and teeth, especially our third molars, become impacted,” Guatelli-Steinberg said.

Teeth are the most preserved skeletal remains found in fossils, making them easily available for discovery and studying. Small and very mineralized, they are resistant to decomposition and able to maintain their original qualities, Guatelli-Steinberg said. Teeth also contain records of their development, including their chemistry and pathology. For example, researchers study the structure of teeth, such as bumps and grooves, to see how species are related to one another.

Guatelli-Steinberg said she expects future anthropologists will “likely have a field day” studying modern human teeth. “In various cultures today, we have people who notch teeth, inlay them with jewels or gold, lengthen them, file them down and remove them altogether,” she said. “One can only imagine what anthropologists will make of all the things we do to our teeth today.”

Scuba Divers Should Visit Dentist Before Diving

Recreational scuba divers who recently received dental care should consider consulting with their dentists before taking their next plunge. A new pilot study found that 41 percent of divers experienced dental symptoms in the water, according to new research from the University at Buffalo.

The study, “Prevalence of dental problems in recreational scuba divers,” published last month in the *British Dental Journal*, was inspired by the lead author’s first experience with scuba diving in 2013. Although she enjoyed being in the water, Vinisha Ranna, BDS, a student in the UB School of Dental Medicine and certified stress and rescue scuba diver, couldn’t help but notice a squeezing sensation in her teeth, a condition known as barodontalgia.

Published research on dental symptoms experienced while scuba diving is scarce or focuses largely on military divers, said Ranna, so she crafted her own study using an online survey that was distributed to 100 certified recreational divers. Her goal was to identify the dental symptoms that divers experience and to detect trends in how or when they occur.

Of the 41 participants who reported dental symptoms, 42 percent experienced barodontalgia, 24 percent described pain from holding the air regulator in their mouths too tightly and 22 percent reported jaw pain. Another 5 percent noted that their crowns were loosened during their dive, and one person reported a broken dental filling.

“The potential for damage is high during scuba diving,” said Ranna, who has completed 60 dives. “The dry air and awkward position of the jaw while clenching down on the regulator is an interesting mix. An unhealthy tooth underwater would be much more obvious than on the surface.”

For more information, read the study in the *British Dental Journal* 221, 577–581 (2016).
Dental Implant Coatings Help Prevent Infection

Mouth infections are currently regarded as the main reason dental implants fail. A piece of research by the UPV/ EHU-University of the Basque Country has succeeded in developing coatings capable of preventing and eliminating potential bacterial infection, according to a study published in the December issue of the *Journal of Non-Crystalline Solids*. The coatings also provide implants with osseointegrating properties that facilitate anchoring to the bone.

Beatriz Palla, a researcher in the biomaterials group of the UPV/ EHU’s department of polymer science and technology, said the quest for surfaces capable of preventing bacterial colonization and adhesion in the area surrounding the implant was borne out of the huge number of publications that have been developed in the field.

“We had already obtained coatings that facilitate the generating of bone around the implant and thus facilitate anchoring to the bone. In a bid to go a step further, we looked at how to turn these coatings into bactericides,” Palla said.

In the study, Palla developed three types of coatings depending on the various antibacterial agents chosen; each one had a mechanism to tackle bacterial infections, either prophylactically by preventing the bacteria from becoming adhered initially and the subsequent infection or by eliminating it once it developed.

In view of the results, Palla believes that “it is possible to confirm that coatings with an antibacterial capability and which do not affect the proper integration of the implant into the jawbone have been developed.” She also admits, however, that there is still a long way to go until they can be applied and used at dentists’ surgeries.

“Apart from all the trials that remain to be carried out, it would also be advisable to pursue the research a little further to optimize the results more,” she said.

For more information about the study, see the *Journal of Non-Crystalline Solids* vol. 453, 1 December 2016, pp. 66–73.

Alzheimer’s Drug Could Reshape Dental Treatments

A new method of stimulating the renewal of living stem cells in tooth pulp using an Alzheimer’s drug has been discovered by a team of researchers at King’s College London.

Scientists from the Dental Institute at King’s College London have proven a way to stimulate the stem cells contained in the pulp of the tooth and generate new dentine in large cavities, potentially reducing the need for fillings or cements, according to a paper published in *Scientific Reports*. Significantly, one of the small molecules used by the team to stimulate the renewal of the stem cells included Tideglusib, which has previously been used in clinical trials to treat neurological disorders including Alzheimer’s disease. This presents a real opportunity to fast-track the treatment into practice, the scientists say.

Using biodegradable collagen sponges to deliver the treatment, the team applied low doses of small molecule glycogen synthase kinase (GSK-3) to the tooth. They found that the sponge degraded over time and that new dentine replaced it, leading to complete, natural repair. Collagen sponges are commercially available and clinically approved, again adding to the potential of the treatment’s swift pick-up and use in dental clinics.

Lead author of the study, Paul Sharpe, Dickinson professor of craniofacial biology at Kings College, said the “simplicity of our approach” makes it ideal as a clinical dental product for the natural treatment of large cavities by providing both pulp protection and restoring dentine.

“In addition, using a drug that has already been tested in clinical trials for Alzheimer’s disease provides a real opportunity to get this dental treatment quickly into clinics,” he said.

Learn more about this study at nature.com/articles/srep39654.

CORRECTION

It has come to the attention of the *Journal of the California Dental Association* that the digital image that was originally published with the article “Bite-Mark Pattern Injury Analysis: A Brief Status Overview” in the June 2015 issue of the Journal was used in the Journal’s February 2017 issue without permission of its copyright owner, Gregory S. Golden, DDS, and has been removed at his request.
The Management of Infections and the Use of Antibiotic Prophylaxis by Dentists: A Review of the Evidence

George Maranon, DDS

ABSTRACT Dentistry plays an important role in managing the antibiotic resistance problem. Guidelines for the use of antibiotics for prevention of endocarditis, prosthetic joint infections and other medical conditions have changed frequently. Unfortunately, the original guidelines and subsequent changes were often made through consensus opinions and not evidence based. Clinical decisions on the use of antibiotics must be made on the basis of the scientific evidence with knowledge of the most current guidelines and indications.

AUTHOR

George Maranon, DDS, is a diplomate of the American Board of Oral and Maxillofacial Surgery. He received his dental degree from the University of California, Los Angeles, and his medical degree from New York Medical College and completed his residency in oral and maxillofacial surgery at the Westchester County Medical Center. He maintains a private practice in oral and maxillofacial surgery in Encino, Calif.

Conflict of Interest Disclosure: None reported.

For the past 70 years, antibiotics have proven to be a powerful adjunct in the management of infection. In spite of this, even the appropriate use of antibiotics carries personal and community risk of bacterial resistance and adverse events. As health care professionals, dentists have a responsibility to help reduce the risk of bacterial antibiotic resistance.

For patients at risk for infectious endocarditis or prosthetic joint infection after dental procedures, it is important that clinicians use the most current antibiotic prophylaxis guidelines. The cooperation of the dentist and physician in the management of these patients is imperative.

Dentists prescribe antibiotics prior to prophylaxis to prevent infective endocarditis and prosthetic joint infections, to reduce or prevent postsurgical infections and to manage infections. The inappropriate or misuse of antibiotics has raised concerns about antibiotic resistance. Although there are often guidelines, it may be difficult for clinicians to decide in which situations antibiotics are indicated. What follows is a summary of the literature concerning clinical situations involving the use of antibiotics by dentists.

Infectious Endocarditis and Prosthetic Joint Guidelines for the Use of Prophylactic Antibiotics

The American Heart Association (AHA) and the American Dental Association (ADA) have issued antibiotic prophylaxis guidelines to prevent infective endocarditis for high-risk patients undergoing certain dental procedures. It is important to note that the 2007 AHA guidelines stress the
importance of optimum dental health and oral hygiene. For these patients at risk, it is important that the dentist inform the patient about the need for maintaining his or her dental condition at the highest state of health possible1 (TABLES 1–3). There is increased legal risk of establishing guidelines. The ADA Division of Legal Affairs has offered a legal perspective on antibiotic prophylaxis in order to assist dentists with questions regarding the indications and necessity of premedication. The ADA recommends that each dentist use his or her professional judgment in applying the ADA antibiotic guidelines. It points out that occasionally questions might arise when patients present for treatment with a recommendation from their physicians to use antibiotic prophylaxis that is outside the guidelines. The physician’s recommendation may be due to the patient’s medical condition or risk factors not known to the dentist or because the physician is not familiar with the most recent prophylaxis guidelines.

In an updated opinion, the ADA Division of Legal Affairs recommended that the dentist and physician communicate and try to reach agreement on the management of the patient. If consensus cannot be reached, the patient should also be informed that the dentist’s recommendations differ from those of the patient’s physician. The dentist should also provide the patient with a thorough informed consent so that the patient can make his or her own decision whether to use antibiotic prophylaxis. The patient should be encouraged to discuss the treatment options with his or her physician before making a decision.2,3,4

The ADA Council on Scientific Affairs published the most recent version of its clinical practice guidelines concerning prophylactic antibiotics prior to dental procedures in patients with prosthetic joints. It concluded, “In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.” For patients with a history of complications associated with their joint replacement surgery, the council recommends that antibiotics should only be considered after consultation with the patient and the orthopedic surgeon. If it is determined that antibiotics are indicated, the council suggests that the orthopedic surgeon recommend the appropriate antibiotic and when possible provide a prescription. In making that recommendation, the council cited the increased risk of antibiotic resistance and adverse effects.6

Use of Antibiotics in Other Clinical Situations

For most clinical situations encountered by dentists, antibiotics are rarely indicated. In patients with intact defense mechanisms, most of the symptoms associated with these conditions are inflammatory or immunologic in nature. In 2001, the American Academy of Pediatric Dentistry (AAPD) published guidelines to be used by clinicians when prescribing antibiotics to pediatric patients based on their presenting condition. These were revised in 2014. The AAPD states that there are few indications for the use of antibiotics in children.7 In the winter of 2012, the American Association of Endodontists (AAE) published Use and Abuse of Antibiotics to educate the dental community on the appropriate use of antibiotics for dental conditions associated with endodontics. The oral and maxillofacial surgery and periodontal surgery literature are replete with articles on the appropriate management of infections and the use of antibiotics8 (TABLE 4).

The dental pulp presents a unique host environment. The circulation to the pulp is limited and the body’s natural defense mechanisms can be overwhelmed. In spite of this, in the majority of infections,
patients with intact immune systems do not require antibiotic therapy. Even in situations of moderately severe localized infections, these conditions can be managed with incision and drainage and/or removal of the source of the infection (endodontics or tooth extraction) without antibiotic treatment. During infections, the patient’s own systemic defenses are attracted to the area of damaged tissue. In the normal process, an abscess forms as a fibrocollagenous border around the responsible microorganisms and immune mediators isolating them. This border can reduce circulation to the area and prevent antibiotics from reaching the source of the infection. Chronic apical abscesses that are localized or have a draining sinus tract and develop gradually often have mild or no symptoms. If pus is present, this is an indication that the infection is being controlled. These situations should be managed either by incision, extraction of the tooth or endodontic treatment. Again, antibiotic treatment is generally not indicated.11,12

The AAPD recommends that for children with pulpitis, apical periodontitis, draining sinus tract or localized intraoral swelling, the most appropriate treatment is pulpotomy, polypectomy or extraction. Patients should be assessed for signs of systemic infection including fever and facial swelling. If the patient’s condition is localized and there are no signs of systemic infection, it is the opinion of the AAPD that antibiotic therapy is usually not necessary.7 The AAE agrees that antibiotics are not substitutes for surgical intervention (endodontic treatment, incision and drainage or extraction) to remove the source of the infection. The AAE notes that up to 60 percent of human infections resolve by host defenses alone following removal of the cause of the infection.8

According to Baumgartner, erythromycin is not a good choice for endodontics because it is not effective against anaerobes. Clarithromycin and azithromycin have a spectrum of activity that includes facultative bacteria and some anaerobes associated with endodontic infections. Metronidazole is active against anaerobes but not against facultative bacteria and is typically used in combination with penicillin when penicillin alone is not effective. Baumgartner states that cephalosporins, ciprofloxacin, doxycycline and the other tetracyclines are not indicated in these types of infections. If there is a cellulitis, this is an indication that the host response has not yet controlled the infection. In this situation, antibiotics might be necessary though this hypothesis has been extensively studied.15

### TABLE 3

<table>
<thead>
<tr>
<th>Situation</th>
<th>Agent</th>
<th>Regimen: Single dose 30 to 60 minutes before procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Amoxicillin</td>
<td>Adult: 2 g / Child: 50 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Ampicillin OR Cefazolin or ceftriaxone</td>
<td>Adult: 2 g IM or IV / Child: 50 mg/kg IM or IV</td>
</tr>
<tr>
<td>Unable to take medication</td>
<td>Ampicillin OR Cefazolin or ceftriaxone</td>
<td>Adult: 1 g IM or IV / Child: 50 mg/kg IM or IV</td>
</tr>
<tr>
<td>Allergic to penicillins or ampicillin – oral</td>
<td>Cephalexin*† OR Clindamycin OR Azithromycin or clarithromycin</td>
<td>Adult: 2 g / Child: 50 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Cefazolin or ceftriaxone† OR Clindamycin</td>
<td>Adult: 1 g IM or IV / Child: 50 mg/kg IM or IV</td>
</tr>
</tbody>
</table>

**IM indicates intramuscular; IV indicates intravenous**

* Or other first- or second-generation oral cephalosporin in equivalent to adult or pediatric dosage.

† Cephalosporins should not be used in an individual with a history of anaphylaxis, angioedema or urticaria with penicillins or ampicillin.

Management of Patients With Prosthetic Joints Undergoing Dental Procedures

Clinical Recommendation
In general, for patients with prosthetic joint implants, prophylactic antibiotics are not recommended prior to dental procedures to prevent prosthetic joint infection.

For patients with a history or complication associated with their joint replacement surgery who are undergoing dental procedures that include gingival manipulation or mucosal incision, prophylactic antibiotics should only be considered after consultation with the patient and orthopedic surgeon.* To assess a patient’s medical status, a complete health history is always recommended when making final decisions regarding the need for antibiotic prophylaxis.

Clinical Reasoning for the Recommendation
- There is evidence that dental procedures are not associated with prosthetic joint implant infections.
- There is evidence that antibiotics provided before oral care do not prevent prosthetic joint implant infections.
- There are potential harms of antibiotics including risk for anaphylaxis, antibiotic resistance and opportunistic infections like Clostridium difficile.
- The benefits of antibiotic prophylaxis may not exceed the harms for most patients.
- The individual patient's circumstances and preferences should be considered when deciding whether to prescribe prophylactic antibiotics prior to dental procedures.

* In cases where antibiotics are deemed necessary, it is most appropriate that the orthopedic surgeon recommend the appropriate antibiotic regimen and when reasonable write the prescription.

In those situations where endodontic treatment is insufficient in controlling endodontic infections, Baumgartner et al.13 and Skucaite et al.14 reported that penicillin and amoxicillin or clindamycin for penicillin-allergic patients should be considered.

In the event a patient fails to improve, the initial diagnosis needs to be reconsidered. The patient should be re-evaluated to access the need for further surgical intervention. Culturing to determine antibiotic sensitivities for infections is important and may be necessary in instances of antibiotic failure. Empirically, clindamycin may be considered. Clindamycin is given at a dose of 300 mg every six hours with a 600 mg loading dose.

Large Odontogenic Infections With Systemic Signs and Symptoms
In situations where the infection has spread to adjacent areas, incision and drainage, endodontic treatment or extraction are considered primary treatments. This may be sufficient, but antibiotics may be necessary for patients who present with systemic signs and symptoms (fever, lymphadenopathy, trismus, malaise). In vitro, newer and broader spectrum antibiotics were more effective against typical bacteria responsible for odontogenic infections. In contrast, the use of amoxicillin, clindamycin and azithromycin have been shown to result in equal or better clinical outcomes. For patients allergic to penicillin, clindamycin, azithromycin, metronidazole or moxifloxacin can be used as alternatives (TABLE 5). As for the duration of antibiotic therapy, studies have shown that at seven days, there was no difference in clinical cure between antibiotics given for short (one to three days) or long (five to seven days) durations when combined with appropriate surgery.16

Patients with large facial swellings or infections need thorough assessment. A complete medical history and physical examination are necessary. These patients may have compromised host defenses or may have associated medical conditions that may need to be addressed. There may be airway concerns as well as the risk of rapid spread through neighboring fascial spaces to the neck and mediastinum, orbits or brain. The cause of these infections may be related to other conditions such as trauma, malignancies or infection from nonbacterial origin (fungal). If a patient presents with significant infection of odontogenic origin, surgical intervention is again necessary to address the source. Incision and drainage should not be postponed to allow for abscess formation. In some of these cases, the patient may need to be hospitalized and treated in the operating room under general anesthesia. The adjunctive use of oral or intravenous antibiotics may be indicated. The consultation of infectious disease and other medical and surgical specialists may be necessary.

Minor Oral/Facial Injury Management
Because of excellent blood supply to the maxillofacial region, injuries to these structures can often be managed without antibiotics given appropriate wound management. Patients with traumatic injury should be evaluated with respect to host risk (e.g., age, systemic illness, malnutrition) and the nature of the wound when determining the need for antibiotics. Wounds should be classified as either clean, potentially contaminated or contaminated/dirty. Clean wounds are those that are uninfected and show no signs of inflammation. These wounds can be closed primarily. There is no need for antibiotic coverage in these patients. Wounds that are exposed to intrinsic bacteria are classified as potentially contaminated. Examples of this type of wound might be a traumatic self-inflicted laceration from the patient’s own teeth. The initial use of antibiotics in these cases is not indicated, but the wounds must be observed closely for potential late infections. Wounds that have obviously been contaminated by extrinsic bacteria would be classified as contaminated/dirty.17,18
Human or animal bites are considered contaminated/dirty. Bite wounds are at increased risk of infection, but antibiotic prophylaxis continues to be controversial. Early management is important to decrease risk of infection. If indicated, amoxicillin clavulanate is considered the antibiotic of choice. Tetanus and rabies prophylaxis should be considered when appropriate and given per accepted guidelines. These wounds must be monitored closely. The duration of antibiotics should be based on healing. The route of administration (intravenous, intramuscular or oral) and duration of treatment would be determined by the severity of the potential contamination and patient host factors.

Traumatic injuries caused by linear shear forces tend to have less risk of contamination than deep or complex lacerations. Bite or crush injuries are more likely to involve tissue necrosis and infection. In general, antibiotics can help reduce infection risk and promote healing of these types of injuries, but they are not a substitute for vigorous irrigation, surgical debridement and appropriate wound care. Response to antibiotic therapy and wound healing must be closely monitored.

**Salivary Gland Infections**

For suspected salivary gland infections, it must first be determined if the infection is of bacterial etiology. A thorough history and examination must be performed. Swellings in the gland may be secondary to sialoliths, nonbacterial organisms like viruses (mumps, HIV), mycobacteria (e.g., tuberculosis), fungus or, rarely, parasites. They may even have an autoimmune etiology or be associated with a neoplasm. Patients with dehydration or hyposalivation are at risk. This includes the elderly and patients on certain medications (e.g., antihalitases diuretics, anticholinergics, chemotherapeutics). Associated medical conditions such as diabetes, Sjögren’s syndrome, malnutrition, anorexia/bulimia, vomiting/diarrhea, HIV/AIDS, renal failure, liver failure or patients who have received head and neck radiation therapy increase the risk of sialadenitis. Clinically, patients will present with salivary gland enlargement that may or may not be painful. Any purulence should be cultured and antibiotic sensitivities obtained. If the condition worsens while eating, it is suggestive but not pathognomonic of sialolithiasis.

Acute salivary gland infections of bacterial origin respond to antibiotic therapy. Empirically, these conditions can be treated with broad-spectrum penicillins (amoxicillin, amoxicillin clavulanate), first-generation cephalosporins (cephalexin, cefadroxil), clindamycin or a macrolide (erythromycin, azithromycin, clarithromycin). Depending on the severity of the infection, hospitalization with incision and drainage and intravenous antibiotics may be indicated.

**Periodontal Disease**

Periodontal disease is a chronic multifactorial condition. The bacteria associated with periodontal disease are usually divided microbial complexes that live in biofilms. Not only is there a bacterial component to periodontal disease, there are also inflammatory mediators (e.g., cytokines, interleukin-1β, tumor necrosis factor α, prostaglandin E2, IgG 2) that are involved in periodontal disease. It is these inflammatory mediators that are responsible for most of the periodontal tissue destruction.

Concomitant systemic diseases, along with the patient’s own dental and osseous deformities, also affect the progression of periodontal disease. In addition, factors like smoking and stress have an impact. Scaling and root planing (SRP) have been shown to be the most effective way of managing periodontal disease. The goal of SRP is to disrupt the biofilm and eliminate the inflammation. However, SRP is not as effective deep in periodontal pockets where bacteria can invade the epithelium and where there are architectural barriers (e.g., furcations, grooves, dentinal tubules). For this reason, systemic combination drug therapy has been advocated for patients who have specific microbiological profiles in their subgingival biofilm. There is support for the use of systemic antibiotic in the treatment of periodontal disease that progresses in spite of conventional mechanical treatment. These drugs enter the periodontal tissues and the sulcus via the bloodstream to areas that cannot be reached by instrumentation. Unfortunately, the subgingival biofilm may be protective as the matrix can act as a barrier to antibiotics and facilitate horizontal resistance gene transfer.

The American Academy of Periodontology (AAP) addressed the issue of the use of systemic antibiotics in the treatment of periodontal disease in a position paper. In that report, the AAP stated that the use of systemic antibiotics in the treatment of periodontal disease is to reinforce mechanical treatment and to support host defenses. The AAP recommended that consideration should be given to single or combination drug...
therapy based on the individual clinical situation. If combination therapy is indicated, they cautioned that care must be taken to select combinations that are not antagonistic. For example, bacteriostatic tetracyclines halt bacterial reproduction hindering the bactericidal actions of β-lactam antibiotics.

In the position paper, the AAP provided clinicians with a list of frequently prescribed antibiotics for the treatment of aggressive periodontal disease (Table 6). The AAP report stated that the optimum dosage of the antibiotics remains unclear and that most antibiotic regimens for the management of aggressive periodontal disease have been developed empirically.29

Some studies have questioned whether improvement in periodontal disease with the adjunctive use of systemic antibiotics was clinically meaningful.30,31 Because of the wide variability of antibiotic-resistant pathogens in periodontal disease, it has been suggested that microbiological analysis and antibiotic susceptibility testing to determine antibiotic sensitivities and the minimal inhibitory concentration (MIC) be conducted when systemic antibiotics are being considered.32 There is no evidence that systemic antibiotics are effective as monotherapy without SRP in treating periodontal disease.33

A panel of experts was assembled by the Council on Scientific Affairs of the ADA to review the literature and develop clinical practice guidelines on nonsurgical treatments for patients with chronic periodontitis with and without adjuncts. The panel found that for patients with chronic periodontitis, SRP showed a moderate benefit as the initial nonsurgical treatment of this condition. They suggested the use of systemic subantimicrobial-dose doxycycline (SDD), 20 mg twice a day for six to nine months, as an adjunct to treatment with SRP resulted in a small net benefit (0.35 mm net gaining clinical attachment). The panel felt that there were negligible adverse effects and that the risk of antimicrobial resistance was not a factor. The use of systemic antimicrobials like amoxicillin, metronidazole, azithromycin, clarithromycin, moxifloxacin and the tetracyclines at higher doses was also reviewed. Even though the net benefit was the same as the use of SDD (mean 0.35 mm gain in clinical attachment), the panel felt that these higher doses were not justified because of the increased risk of adverse effects and antibiotic resistance. The panel recommended that these drugs at higher doses should be reserved for short-term (less than 21 days) use only.34,35

**Table 6**

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Adult Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metronidazole</td>
<td>500 mg/t.i.d./8 days</td>
</tr>
<tr>
<td>Clindamycin</td>
<td>300 mg/t.i.d./8 days</td>
</tr>
<tr>
<td>Doxycycline or minocycline</td>
<td>100–200 mg/q.d./21 days</td>
</tr>
<tr>
<td>Ciprofloxacin</td>
<td>500 mg/b.i.d./8 days</td>
</tr>
<tr>
<td>Azithromycin</td>
<td>500 mg/q.d./4–7 days</td>
</tr>
<tr>
<td>Metronidazole + amoxicillin</td>
<td>250 mg/t.i.d./8 days of each drug</td>
</tr>
<tr>
<td>Metronidazole + ciprofloxacin</td>
<td>500 mg/b.i.d./8 days of each drug</td>
</tr>
</tbody>
</table>


**Extraction of Teeth**

There are many indications for the extraction of teeth. Some of these extractions may or may not be associated with infection. Some examples are the extraction of impacted teeth, supernumerary teeth or because of acute fractures of roots or coronal portions. Teeth are also extracted for prosthetic purposes, cosmetic concerns or as indicated by orthodontic treatment. These extraction sites are considered contaminated by virtue of their exposure to the oral cavity. Because the microorganisms involved are part of the host’s normal oral flora, pre- or postsurgical antibiotics are not indicated. The use of prophylactic antibiotics prior to tooth extraction has been suggested if the patient’s immune status is compromised (e.g., poorly controlled diabetes, end-stage renal disease, alcoholism, immune compromising diseases). The literature does not necessarily support the need for antibiotic prophylaxis in these situations. Studies have shown that there are no differences in healing after routine extractions between well-controlled and poorly controlled diabetics. In addition, studies have shown that patients with either alcoholic liver disease, renal disease or patients who are HIV positive with CD4 counts greater than 200 are at low risk for postsurgical infections for routine extractions.36

With respect to the extraction of teeth in the presence of infection, early extraction is associated with faster clinical and biologic resolution of infection.37 Delay in the extraction of necrotic teeth risks the spread of the infection.

**Extraction of Impacted Third Molars**

Postsurgical surgical site infection (SSI) related to third molar surgery occurs at a frequency of between 1.2 to 27 percent with the most reported frequency at 5 percent. In spite of 60 years of clinical experience and numerous clinical studies, the indications for the use of prophylactic antibiotics for the extraction of third molar teeth remains unclear. Most of the studies were not performed in the typical outpatient oral surgery setting. There was variability in the type of anesthesia provided for these cases. Some of the procedures were performed under local anesthesia while others were performed under general anesthesia. An additional variable was the use of nonstandard antibiotic regimens, dosing strategies and intervals. There is some evidence that prophylactic antibiotics reduced the risk of infection,
The placement of dental implants has become a predictable method of replacing teeth. The question is whether antibiotic prophylaxis is indicated for implant placement to reduce the chance of implant failure or postsurgical infection. Esposito et al. performed systemic reviews and analysis of randomized control trials of healthy participants given preoperative amoxicillin versus placebo prior to implant placement. Their last report was an analysis that included six trials that showed there was a statistically significant higher percentage of implant failures in the placebo group versus the antibiotic group. This finding translated to the number needed to treat (NNT) with prophylactic antibiotics for one additional beneficial (prevention of one failure) outcome was 25. They reported that that there was no statistically significant difference for postsurgical infections. Another independent systemic review and meta-analyses had similar findings. Finally, in a study of 2,973 implants, the Dental Implant Clinical Research Group found significantly higher survival rates for dental implants if patients were given presurgical antibiotics.

There are also studies that do not support presurgical antibiotics prior to implant placement. These clinical trials found that there was no significant difference in postoperative infections, adverse events or implant failures in patients given preservative antibiotics. The effectiveness of postsurgical antibiotics on implant survival rates has also been questioned when single-dose preoperative antibiotics was compared with one week of postoperative antibiotics.

In a study of 2,973 implants, the Dental Implant Clinical Research Group found significantly higher survival rates for dental implants if patients were given presurgical antibiotics.

In practice, there is significant confusion concerning the effectiveness of antibiotic therapy in dental implant success. So much so that a study of 217 oral and maxillofacial surgeons found no consensus concerning the use of preoperative antibiotics. Though most studies only support the use of presurgical antibiotic prophylaxis prior to implant placement to reduce failures, a significant number prescribed postsurgical antibiotics.

With respect to intraoral bone grafting, there are few studies on this subject. A prospective placebo-controlled, double-blind pilot study of 20 patients reported that there was a statistically significant decrease in infections after intraoral bone grafting if 2 g of pheneticillin (a semisynthetic acid-resistant analog of penicillin) was administered one hour before surgery.

Another study of 23 subjects failed to find a significant benefit. Because of the lack of research, the benefit of antibiotics and implant placement and intraoral bone grafting is also unclear. Further research needs to be performed on the most effective antibiotic dosing regimen and whether postsurgical antibiotics are beneficial.

Medication-Related Osteonecrosis of the Jaw

In 2014, the AAOMS published a position paper, “Medication-Related Osteonecrosis of the Jaw” (MRONJ). This condition, originally named bisphosphonate-related osteonecrosis of the jaw (BRONJ), involves osteonecrosis related to the use of bisphosphonates. The name was changed to MRONJ because a large number of osteonecrosis cases began to be identified involving other antiresorptive (denosumab) and antiangiogenic (bevacizumab, sorafenib, sunitinib, pazopanib, everolimus) medications. Intravenous forms of these medications (zoledronate, ibandronate) are used to treat hypercalcemia of malignancy, bone metastasis of breast, prostate and lung cancers and multiple myeloma. Intravenous and oral bisphosphonates (alendronate, ibandronate, risedronate and zoledronic acid) are approved for the treatment of osteoporosis and osteopenia. Patients are considered to have MRONJ if they have exposed bone in the maxillofacial region that can be probed either intraorally or extraorally and that has been present for at least eight weeks, currently or previously treated with antiresorptive or antiangiogenic medications and have no history of radiation therapy to the jaws or metastatic disease in the jaws.

In its position paper, the AAOMS made stage specific MRONJ treatment recommendations. For patients in early stages (Stage 0) of MRONJ, there may be a role for systemic antibiotics.

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high doses of radiation are at risk for Some of these patients who received radiation therapy for oral pharyngeal malignancies. Osteoradionecrosis of the Jaw — 2014 Update.

Other bacteria cultured from exposed bone are typically sensitive to the -lactamase. Bacteria cultured from exposed bone are typically sensitive to the -lactamase. Quinolones, metronidazole, clindamycin, doxycycline and erythromycin have been successful for patients who are allergic to penicillin (TABLE 7).

### Staging and Treatment Strategies

<table>
<thead>
<tr>
<th>MRONJ† Staging</th>
<th>Treatment Strategies†</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>At-risk category</strong> No apparent necrotic bone in patients who have been treated with either oral or IV bisphosphonates</td>
<td><strong>No treatment indicated</strong></td>
</tr>
<tr>
<td><strong>Stage 0</strong> No clinical evidence of necrotic bone, but nonspecific clinical findings, radiographic changes and symptoms</td>
<td><strong>Patient education</strong></td>
</tr>
<tr>
<td><strong>Stage 1</strong> Exposed and necrotic bone, or fistulae that probes to bone, in patients who are asymptomatic and have no evidence of infection</td>
<td><strong>Systemic management, including the use of pain medication and antibiotics</strong></td>
</tr>
<tr>
<td><strong>Stage 2</strong> Exposed and necrotic bone or fistulae that probes to bone, associated with infection as evidenced by pain and erythema in the region of the exposed bone with or without purulent drainage</td>
<td><strong>Antibacterial mouth rinse</strong></td>
</tr>
<tr>
<td><strong>Stage 3</strong> Exposed and necrotic bone or fistulae that probes to bone in patients with pain, infection and one or more of the following: exposed and necrotic bone extending beyond the region of alveolar bone (i.e., inferior border and ramus in the mandible, maxillary sinus and zygoma in the maxilla) resulting in pathologic fracture, extraoral fistula, oral antral/oral nasal communication or osteolysis extending to the inferior border of the mandible of sinus floor</td>
<td><strong>Clinical follow-up on a quarterly basis</strong></td>
</tr>
</tbody>
</table>

1 Exposed or probable bone in the maxillofacial region without resolution for greater than eight weeks in patients treated with antiresorptive and/or an antiangiogenic agent who have not received therapy to the jaws.

2 Regardless of the disease stage, mobile segments of bony sequestum should be removed without exposing uninvolved bone. The extraction of symptomatic teeth with exposed necrotic bone should be considered because it is unlikely that the extraction will exacerbate the established necrotic process.


### Osteoradionecrosis of the Jaw

Dentists may encounter patients who have received radiation therapy for oral pharyngeal malignancies. Some of these patients who received high doses of radiation are at risk for developing osteoradionecrosis of the jaw (ORN). The use of hyperbaric oxygen (HBO) therapy was proposed for the prevention and management of ORN by Marx based on his theory of hypoxic–hypocellular–hypovascular tissue after radiation therapy (> 6000 cGy). Bacterial infections are not the cause of ORN, but are considered a contaminant or superinfection. At best, the use of antibiotics should only be used to prevent or manage infection of impaired tissue. In infections associated with ORN, cultures and determination of antibiotic sensitivities are important.

### Health Care-Associated Infections

Health care-associated infections refer to infections associated with health care delivery in any setting (e.g., hospitals, long-term care settings, dental trimarble settings, home care). Health care workers and patients may be colonized with, or exposed to, potential pathogens outside of the health care setting before receiving care or may develop infections caused by those pathogens when exposed to the conditions associated with delivery of health care. Dentists must recognize their role in transmission of disease.

Organisms (bacteria, fungi and viruses) can be spread from patient to patient from contaminated health care workers. Close attention should be paid to asepsis and infection control. This includes standard precautions like hand hygiene, surface disinfection and sterilization procedures, the possibility of cross-contamination and following strict surgical protocols. Policies should be in place for handling and processing patient care equipment and devices contaminated with blood or body fluids. Staff members must have the appropriate personal protective equipment (gloves, gowns, face and eye protection) and protocols for prevention of sharps injury. Antibiotics should not be used as an excuse for inadequate infection control procedures.
Conclusions

In treating infections, an accurate diagnosis needs to be made to determine if there is a need for antibiotic therapy. The acute or chronic stage of the infection may dictate whether antibiotics are indicated. Antibiotics cannot be a substitute for conventional therapy including indicated surgical procedures. Patient host factors and immune status need to be determined. Antibiotics should only be used to support the patient’s immune system in controlling infection. The use of antibiotics should only be considered if there is an inadequate host immune response with systemic signs or progression of the infection beyond the source to adjacent tissues or spaces. The use of these drugs is not indicated to control pain in the absence of signs and symptoms of a progressive infection.

Dentists are fortunate in that most odontogenic infections requiring treatment with antibiotics respond well to penicillin. For this reason, the choice of antibiotics can frequently be made empirically. Based on each patient’s presenting condition and comorbidities, adjustments may be necessary when considering antibiotic therapy. It is important that the dentist be familiar with the characteristics and effects of an antibiotic so they are used appropriately.

Antibiotics should be prescribed at dosages that rapidly achieve high serum concentrations. The most appropriate dosing schedules must be prescribed based on the antibiotic’s mechanism of action. Except in some severe infections and aggressive or refractory periodontal conditions, it is rare that multiple antibiotic therapy is indicated.

It is important that antibiotics are not used beyond the resolution of the infection. Any patient who is prescribed antibiotics for infection must be monitored closely for improvement. If the condition improves sufficiently, antibiotic therapy should be discontinued. Changes in antibiotic use should not be performed too quickly. At least 48 to 72 hours may be necessary for an antibiotic to have an effect.

Prior to using antibiotics for infection management, patients must receive a thorough informed consent of the risks and benefits of using antibiotics. This must include possible antibiotic effects on medical and dental conditions they may have, age-related effects, drug interactions, the risk of allergies, other possible adverse effects, the likelihood of improvement and cost.

There may be some usefulness in long-term, low-dose antibiotic therapy for chronic progressive periodontal disease. Preoperative antibiotics may minimize the chance of postsurgical wound infections and wound healing complications associated with the extraction of impacted third molars. In addition, preoperative antibiotics may decrease dental implant and intraoral bone failure rates. It appears that postoperative antibiotic therapy is generally not indicated for an otherwise immune competent patient to prevent postsurgical wound infection or as pain medication. There is a role for antibiotics in the management of opportunistic infections related to MRONJ and osteoradionecrosis.

Antibiotic medications should never be used for preventing medicolegal claims. It is incumbent upon the dentist to inform the patient of the importance of strictly following dosing schedules. A lack of patient compliance with dosing schedules can contribute to antibiotic failure and the risk of bacterial resistance. Considerations should be given to using antibiotic preparations that have dosing intervals that are easier to follow or use.

Recommendations and antibiotic prophylaxis guidelines can change rapidly. It is important that dentists keep abreast of the literature and any changes in guidelines. Dentists should work cooperatively with their medical colleagues concerning the most appropriate antibiotic prophylaxis for each patient. Each patient has a role in making decisions concerning his or her care. Prescribing stewardship is one of the main ways dentists can reduce the risk of antibiotic resistance. With each antibiotic prescription, the patient’s individual risk and the community’s risk of antibiotic resistance must be weighed.

REFERENCES


Management of Mandibular Fractures in Pediatric Patients With Conservative Technique: A Case Series

Manisha Sahni Prabhakar, MDS; Khushboo Kansal, BDS; and Arjun Chawdhry

ABSTRACT The management of fractures in children is complex compared to that of adults because of greater elasticity of bone, presence of tooth buds, faster healing rate, potential for future growth and lesser co-operative ability. Fractures of the mandible in children are conventionally treated by circummandibular wiring. This paper reports a variation in the technique of using circummandibular wiring with acrylic splints in the conservative treatment of mandibular fractures in two pediatric patients.
In pediatric patients generally, undisplaced body, symphysis and condylar fractures can be treated with close observation, blenderized diet and avoidance of physical activities. But if fractures are displaced, close reduction with or without immobilization should be considered. The exact method of immobilization depends on the child’s chronological age and stage of dental development. If the teeth are inadequate to support wiring or splints, the fracture site should be immobilized and stabilized with acrylic or lingual splint for three to four weeks. Intermaxillary fixation might be required if the fracture is not adequately immobilized by splint.

An understanding of all the treatment options is essential for optimal management of these injuries. This paper reports two pediatric cases of mandibular fractures that were treated with acrylic splint using a modified circummandibular wiring method.

Conventionally, circummandibular wiring is performed with a mandibular awl, but a wound created by awl is quite conspicuous. In this article, we are using a variation of this technique by using a 20-gauge spinal needle with 26-gauge orthodontic wire for stabilization of the splint. This method is simple, conservative and easy to fabricate, causes minimal trauma to surrounding tissues, is cost effective and has good stability during the healing period.

Discussion

The management of jaw fractures in cases of pediatric patients is very challenging to dentists. Although the signs and symptoms in pediatric patients are the same as those in adults, the treatment plan changes due to the growth of jaws and the developing dentition.

Treatment of a pediatric patient depends on the stage of skeletal and dental development, keeping in mind the type of fracture. Fractures without displacement can be managed by close observation, soft diet, restriction of physical activities and analgesics.

But in fractures with displacement and deranged malocclusion, management with either closed or open reduction has to be done by splints and arch bars for two to three weeks. Rarely, where a fracture is limited to alveolar process, long-term mono-maxillary immobilization (via splinting) is indicated for up to two months to prevent malocclusion.

Intermaxillary fixation using arch bars and eyelets can also be used for the management of mandibular fractures. It is a noninvasive, simple and low-cost technique, but the arch bars and wires cause irritation to the supporting tissues and lead to periodontal problems. The foundation for the arch bars is technically very challenging due to the conical and tapered shape of crown and wide cervical area. The primary teeth can be avulsed out during the procedure. Also, the wires restrict the diet of the child, leading to weight loss.

Open reduction rigid internal fixation (ORIF) using plates and screws is also one of the options in which fixation is achieved under direct vision and with better approximation. Zimmerman et al. said in 2006 that in pediatric fractures ORIF provides stable three-dimensional reconstruction, promotes primary bone healing, shortens treatment time and eliminates the need for or permits early release of maxillomandibular fixation.

But this treatment modality remains controversial in pediatric patients. The mandibular cortex is thin and less dense than in adults. This could lead to the plates being visible or palpable through the child’s skin or the screws and plates could migrate as the teeth are in an eruptive stage. Also, the danger of damage to the permanent tooth buds during the placement of screws, restriction of growth of the jaws because of periosteal stripping, pain and secondary infection preclude the use of ORIF as treatment of choice. ORIF in parasymphysis fractures can safely be done after 9 years of age when the permanent buds of the canines have moved up from their inferior position at the mandibular border.

The need for open reduction in pediatric fractures is minimal because malunion or nonunion in children is rare due to their greater osteogenic potential and faster healing rates. Keeping in mind all the above factors, mandibular fractures in children are best treated by conservative methods. We were able to successfully manage the cases by using acrylic cap splints with modified circummandibular wiring. An acrylic cap splint is cost effective, easy to fabricate, requires less chair time, provides adequate stability to fragments and causes minimal trauma to supporting tissues. The modified technique...
of circummandibular wiring using a 20-gauge spinal needle and orthodontic wire was atraumatic and led to a smaller wound with a resultant smaller scar. Reduction of fractured segments by splints was achieved as close as possible to the original positions and gave us satisfactory results in both cases posttreatment.

Case Reports

Case One

A 5-year-old boy reported to the department of pedodontics and preventive dentistry in Gian Sagar Dental College and Hospital in Rajpura, Punjab, India, with the chief complaint of facial injury due to a fall from height. There was no history of loss of consciousness, vomiting or seizures, bleeding from the nose or ears or any other injuries, as elicited by the mother. The patient was conscious, cooperative and well oriented in time and place.

On extraoral examination, there was swelling on the left side of the face and lacerations near the angle of the mouth and left side of the forehead.

Intraoral examination revealed bleeding within the mouth, limited mouth opening and deranged occlusion with a displaced fracture between teeth O and N (Figure 1).

A CT scan of the head was taken to rule out any component of head injury (Figure 2). Panoramic radiograph confirmed the diagnosis of parasympyseal fracture (fractures present lateral to mental prominences in mandible). A fracture line was seen commencing superiorly between mandibular left central and lateral incisors and extending up to the inferior border of the mandible on the same side (Figure 3).

Primary treatment was instituted and lacerated wounds were sutured. Informed consent was obtained from the parents prior to treatment. Maxillary and mandibular impressions were made in alginate and casts were poured in dental stone. For the mock surgery, the fractured site was marked on the mandibular cast and then split into two segments with an electric saw (Figure 4). The cast segments were then joined with sticky wax in a reduced position simulating the intact arch and after achieving proper occlusion with maxillary cast (Figure 5). The casts were mounted on an articulator (three point or mean value articulator). After the blockage of undercuts, an interocclusal splint was fabricated using clear self-cure acrylic on the mandibular cast (Figure 6). An arch wire was incorporated into the splint in order to facilitate doing intermaxillary fixation on this patient if required at a later stage.

The splint was disinfected by overnight immersion in 2% gluteraldehyde.

The patient was recalled on the next day and premedicated with oral midazolam in a dosage of 0.5 mg/Kg body weight.15 The premedication was administered using clear apple juice as the carrier vehicle 30 minutes before surgery. Under local anesthesia, the mandibular arch was manually reduced.
and a splint was tried for stability taking occlusion as a guidance. To stabilize the fracture segments with the splint, circummandibular wiring was done (steps 1–3). The 20-gauge spinal needle was introduced through the skin and taken out lingually close to the body of the mandible (FIGURE 7). A 26-gauge orthodontic wire was then inserted into the lumen of the spinal needle and clamped intraorally. The spinal needle was then passed on the buccal side through the same puncture hole in proximity to the bone (FIGURE 8).

Both buccal and lingual ends of wires were held together, freed from skin over the mandible by a sawing motion (pulling the two free ends alternatively) and the splint was stabilized by twisting the wire in a clockwise direction (FIGURE 9). This procedure was repeated on the other side (FIGURE 10). Finally, stability of the splint was verified (FIGURE 11). Postoperative instructions were given to the patient and medications were prescribed.

After 21 days, the splint was removed as healing had occurred satisfactorily and uneventfully without any complications. Masticatory functions were restored and the minimally invasive treatment proved quite effective (FIGURE 12). The patient was kept under supervision for three months.
Case Two

A 2-year-old boy reported with the chief complaint of trauma due to a fall from height. The patient had no history of loss of consciousness and no bleeding from nose or ears. A CT scan was advised for the patient. The CT revealed that there was no head injury but a bony fracture was found in the symphyseal region of the mandible (FIGURES 13 and 14). On extraoral examination, there was swelling of upper and lower lips. Intraoral examination revealed deranged occlusion with step deformity and spacing between the maxillary central incisors. Informed consent was obtained from the parents. Oral premedication was given 30 minutes prior to taking impressions. Maxillary and mandibular impressions were made and cast fabrication was done. Mock surgery was done and casts were then mounted on an articulator. After the blockage of undercuts, a cap splint was fabricated using clear self-cure acrylic.

Under premedication and local anesthesia, the mandibular arch was manually reduced and a splint was tried for stability. Modified circummandibular wiring was done with the splint in position (FIGURE 15) and stability of the splint was verified. Postoperative instructions and medications were given to the patient.

After 21 days, the splint was removed. In the postoperative orthopantomogram, fracture reduction occurred satisfactorily and masticatory functions were restored subsequently.

Conclusion

The management of mandibular fractures in children is complex and conventionally done by circummandibular wiring with a mandibular awl. The twisted ends of the awl could cause trauma to the surrounding soft tissues because of its sharpness and thickness. In this case, a modified atraumatic technique of placing circummandibular wiring was used, in which a 20-gauge spinal needle along with a 26-gauge orthodontic wire were used to stabilize the splint. Not only is it economical and disposable, this technique, being sharp in nature, also leaves a smaller wound leading to a smaller scar.

REFERENCES

THE CORRESPONDING AUTHOR, Manisha Sahni Prabhakar, MDS, can be reached at prof.manisha@gmail.com.
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Ex Vivo Assessment of Photodynamic Therapy in Achieving Microbial Reduction

Rodrigo Rodrigues Amaral, DDS, MS; Eduardo Nunes, DDS, MS, PhD; Maria Eugênia Alvarez-Leite, DDS, MS, PhD; José Cláudio Faria Amorim, DDS, MS, PhD; Martinho Campolina Rebello Horta, DDS, MS, PhD; Maria Ilma de Sousa Cortês, DDS, MS, PhD; Frank Ferreira Silveira, DDS, MS, PhD; and Stephen Cohen, MA, DDS

ABSTRACT The study was to assess the effects of photodynamic therapy (PDT) on root canals contaminated by Enterococcus faecalis (E. faecalis). PDT was performed with 0.005% methylene blue dye and with a low-intensity red emission laser. Microbiological samples were collected before, immediately and 72 hours after instrumentation. Although PDT performed with the chosen light parameters promoted additional microbial reduction, this therapy did not achieve a statistically significant reduction of E. faecalis.

n the last several decades, endodontics has evolved substantially along with the development and adoption of new technologies and materials. The quality of endodontic treatment has been maximized, and the time required to accomplish it has been substantially reduced. Most therapeutic failures are associated with the persistent presence of microorganisms, which are able to survive chemomechanical preparation or intracanal medication.1

Protected by the favorable anatomy of the root canal system (RCS), microorganisms cannot be reached by the host’s defenses or systemic antibiotics. Microorganisms are eliminated by the mechanical action of instruments, the irrigation process and the action of antimicrobial irrigants and intracanal medication. Several studies have shown...
that chemomechanical preparation in combination with sodium hypochlorite solution at different concentrations does not completely eliminate microorganisms from the RCS, which can still be found in 40-60 percent of teeth and thus represent a negative factor for the success of endodontic treatment.2-5

The microorganism Enterococcus faecalis (E. faecalis) has been reported as the most prevalent species associated with endodontic treatment failure and was isolated in 70 percent of such cases.1,4,6 E. faecalis is resistant to most intracanal medications, including calcium hydroxide, tolerates pH levels up to 11.5 and can lead to mono-infection, which is extremely difficult to eradicate by conventional methods. The presence of E. faecalis at the time of root canal obturation can be a continuing source of infection.5,9

Photodynamic therapy (PDT) has emerged as a promising antimicrobial treatment. PDT involves the use of a photosensitizer (dye) that is activated by light at a specific wavelength in the presence of oxygen. Energy transference from the activated photosensitizer to available oxygen results in the formation of toxic oxygen species, such as singlet oxygen and free radicals. These oxygen species are highly reactive and harm proteins, lipids, nucleic acids and other microbial cellular components.10

To assess the effectiveness of photodynamic therapy in achieving microbial reduction in root canals contaminated by E. faecalis, our study employed an ex vivo comparative design.

Materials and Methods

The sample consisted of 28 human single-root teeth extracted for several reasons and freely and spontaneously donated by patients who signed an informed consent form. The research ethics committee at Pontifical Catholic University of Minas Gerais approved the study.

The teeth were stored in 0.5% sodium hypochlorite solution for two to four weeks. The crowns were removed at the cementoenamel junction using a diamond disk. The canals were instrumented sequentially using #15 to #20 K-type files (Dentsply Maillefer, Ballaigues, Switzerland) at the level of the apical foramen, as established by direct visualization. Preliminary instrumentation was facilitated by irrigation with 1 mL of 5.25% sodium hypochlorite (NaOCl) solution. To remove the smear layer, the root canal was flooded with 1 mL of 17% ethylenediaminetetraacetic acid (EDTA) solution, pH 7.4, for three minutes followed by final irrigation with 5.25% NaOCl solution. After the canals were dried with size 20 Endo Points absorbent paper points, (Endo Points Industrial da Amazônia Ltda., Manacapuru, Brazil) a #20 K-type file was stabilized at working length (WL) that was established 1 mm short of the apical foramen. Subsequently, the apical foramen and the final 3 mm of the root were sealed with two cyanoacrylate layers (Super Bonder, Henkel Loctite Adhesives Ltd., Itapevi, Brazil). Each root was coupled to the central section of the rubber lid of a glass container, and these experimental units were sterilized with ethylene oxide gas (Curar Centro de Esterilização Ltda., Belo Horizonte, Brazil) and appropriately packaged.

The root canals were contaminated with a suspension of E. faecalis (ATCC 4083, American Type Culture Collection, Manassas, Va.). Microorganisms were seeded in Brain Heart Infusion Agar (BHI) solid medium (Difco Laboratories, Detroit). To prepare the suspension, three to five colonies from a 24-hour culture were added to 5 mL of distilled water and were adjusted to McFarland turbidity standards (3 x 10⁸ cells/mL). One milliliter was removed from the initial suspension to prepare another suspension in 10 mL of BHI broth. After five hours of incubation at 37 degrees Celsius in aerobiosis, approximately 20 mL of the bacterial suspension was applied to each experimental unit by being smoothly injected into each root canal using a plastic syringe. Subsequently, a #15 K-type file was used to drive the bacterial suspension to WL. Each experimental unit was placed in a sterile plastic flask with a screw cap and was incubated for 24 hours at 37 degrees Celsius in aerobiosis. The root canals were reincubated over 21 days at 48-hour intervals with fresh E. faecalis suspensions that were prepared as described above.

The teeth were divided randomly in two experimental groups and two (one positive and one negative) control groups. In group one (n = 10), chemomechanical preparation was performed using 5.25% NaOCl solution as an irrigant. In group two (n = 10), chemomechanical preparation was performed by irrigation of the canals with 5.25% NaOCl solution followed by PDT. The positive control group consisted of four teeth instrumented and irrigated with 0.85% saline solution and the other four teeth were allocated to the negative control group, which was not inoculated with the indicator microorganism.

All root canals were instrumented sequentially up to WL by means of
a rotary instrumentation technique using ProTaper S1, S2, F1, F2 and F3 files (Dentsply Maillefer, Ballaigues, Switzerland); ProTaper F4 (Φ0.40 mm) was used to finish the preparation. Irrigation with 1 mL of 5.25% NaOCl solution was performed after each change of instrument all throughout the preparation using a sterile, disposable plastic syringe. At the end of preparation, root canals were irrigated with 1 mL of 17% EDTA solution, pH 7.4, for three minutes followed by a final irrigation with 1 mL of 5.25% NaOCl solution.

For the PDT group, a 0.005% methylene blue solution (Chimiolux, Hypofarma, Belo Horizonte, Brazil) was used as a photosensitizer for 5 minutes and Twin Flex laser equipment (MMOptics, São Carlos, Brazil) at a 660-nm wavelength and 40 mW of power to a total energy density of 1.8 J/cm². A 300-μm optic fiber (MMOptics) was coupled to the diode laser and was inserted into the root canal 2 mm short of WL, where it was set to allow for better diffusion of light (FIGURE 1).

Before placing the photosensitizer, the canals were irrigated with 1 mL of 0.85% saline solution and dried with Endo Points size FM absorbent paper points. The photosensitizer was placed inside the canals using a sterile disposable syringe and a 23-gauge needle and left for five minutes of pre-irradiation time. Next, irradiation was performed with optic fiber for 180 seconds.

Microbiological samples procedures were blinded and collected before, immediately after and 72 hours after instrumentation. The canals were filled with 0.85% saline solution by means of a sterile, disposable plastic syringe and a 23-gauge needle. Each microbiological sample was collected using FM absorbent paper points previously sterilized with ethylene oxide, left in the canals for one minute. The canals were filled again with 0.85% saline solution and were kept sufficiently hydrated to allow for the collection of samples. The absorbent paper points were transferred to test tubes containing 2 mL of 0.85% saline solution, which were agitated for one minute in a Vortex (Eletrolab, São Paulo, Brazil). For quantitative assessment, the dilutions were performed in triplicate, and 1-mL aliquots of the pure samples and the dilutions of 10⁻¹ to 10⁻⁴ were sown in BHI medium and incubated at 37 degrees Celsius for 48 hours in aerobiosis. Subsequently, the culture growths were counted and the typical morphological characteristics of E. faecalis colonies were sought.

For qualitative assessment, the microbiological samples were collected using a similar procedure as the pure samples using three absorbent paper points before, immediately after and 72 hours after instrumentation, seeded in triplicate in BHI broth, incubated as described above and assessed regarding the presence or absence of medium turbidity. To identify the morphological and tinctorial characteristics of the recovered microorganisms, the samples were stained using Gram’s method.

Microbiological data (colony-forming unit counting) were statistically analyzed by one-way ANOVA followed by Tukey’s post-hoc test. The qualitative data (medium turbidity) were evaluated by Fisher’s exact test. Tests were performed by using GraphPad software (GraphPad Software, San Diego) at significance level of 5 percent.

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td>Mean and Standard Deviation of the Values of CFU Assessment (Log 10)</td>
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<table>
<thead>
<tr>
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<th>Pre-instrumentation</th>
<th>Post-instrumentation</th>
<th>72 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saline solution (positive control group)</td>
<td>6.40 ± 0.22 A,a</td>
<td>1.76 ± 0.19 B,a</td>
<td>1.95 ± 0.24 B,c</td>
</tr>
<tr>
<td>NaOCl (group one)</td>
<td>5.78 ± 0.47 A,a</td>
<td>0.19 ± 0.61 B,b</td>
<td>0 ± 0 B,b</td>
</tr>
<tr>
<td>NaOCl + PDT (group two)</td>
<td>5.77 ± 0.62 A,a</td>
<td>0 ± 0 B,b</td>
<td>0 ± 0 B,b</td>
</tr>
</tbody>
</table>

A,B Within rows, means followed by the same uppercase letter are not significantly different from each other (p > 0.05). P values were obtained by using repeated measurements one-way ANOVA followed by Tukey’s post-hoc test.

a,b Within columns, means followed by the same lowercase letter are not significantly different from each other (p > 0.05). P values were obtained by using one-way ANOVA followed by Tukey’s post-hoc test.

<table>
<thead>
<tr>
<th>TABLE 2</th>
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<tr>
<td>Qualitative Data Evaluation (Medium Turbidity)</td>
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<table>
<thead>
<tr>
<th></th>
<th>Pre-instrumentation</th>
<th>Post-instrumentation</th>
<th>72 hours</th>
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</thead>
<tbody>
<tr>
<td>Saline solution (positive control group/n = 4)</td>
<td>4(+) and 0(-) A,a</td>
<td>4(+) and 0(-) A,a</td>
<td>4(+) and 0(-) A,a</td>
</tr>
<tr>
<td>NaOCl (group one/n = 10)</td>
<td>10(+) and 0(-) A,a</td>
<td>3(+) and 7(-) B,b,a,b</td>
<td>0(+) and 10(-) B,b,b</td>
</tr>
<tr>
<td>NaOCl + PDT (group two/n = 10)</td>
<td>10(+) and 0(-) A,a</td>
<td>2(+) and 8(-) B,b</td>
<td>0(+) and 10(-) B,b,b</td>
</tr>
</tbody>
</table>

Positive (+)/Negative (-)

A,B Within rows, values followed by the same uppercase letter are not significantly different from each other (p > 0.05). P values were obtained by using the Fischer exact test.

a,b Within columns, values followed by the same lowercase letter are not significantly different from each other (p > 0.05). P values were obtained by using the Fischer exact test.
Results

Effective colonization was confirmed by colony-forming unit (CFU) count and medium turbidity assessment of the samples collected before instrumentation (TABLES 1 and 2).

In qualitative analysis, microorganisms were recovered from all samples of the positive control group, from one single sample from group one and no microorganisms measured as CFUs were recovered from samples from group two. In all groups, the CFU count was lower immediately after and 72 hours after instrumentation when compared to the CFU count before instrumentation with no difference between the first (TABLE 1). When the groups were compared, no difference was observed in the CFU count before instrumentation (TABLE 1).

Moreover, the CFU count was lower in groups one and two when compared to the positive control group, immediately after and also 72 hours after instrumentation (TABLE 1). In both collection times, no differences were observed between groups one and two (TABLE 1).

In qualitative analysis, medium turbidity was positive in three samples from group one and in two samples from group two after instrumentation (TABLE 2). Microorganisms were not observed in these two groups 72 hours after instrumentation (TABLE 2). In the positive control group, no differences were observed in medium turbidity between the collection times (TABLE 2). In groups one and two, medium turbidity was lower immediately after and also 72 hours after instrumentation when compared to medium turbidity before instrumentation with no difference between the first (TABLE 2). When the groups were compared, no difference was observed in the medium turbidity before instrumentation (TABLE 2). Immediately after instrumentation, medium turbidity was lower in group two when compared to the positive control group with no difference among the other groups (TABLE 2). Finally, 72 hours after instrumentation, medium turbidity was lower in groups one and two when compared to the positive control group with no difference between the first (TABLE 2).

Discussion

The aim of this study was to assess the effectiveness of photodynamic therapy in achieving microbial reduction in root canals contaminated by E. faecalis with conventional chemomechanical preparation.

E. faecalis was observed in a remarkable proportion of teeth exhibiting persistent periapical lesions, despite well-performed endodontic treatments.

Microorganisms located in ramifications, isthmus and dentinal tubules can escape the effects of the instruments and irrigants used during chemomechanical cleansing of RCS and can eventually lead to late failure of endodontic treatment. The use of EDTA during cleaning of the root canal seems to improve the microorganisms reduction. E. faecalis was selected due to its ability to survive without synergism with other microorganisms, and it seems to tolerate ecological changes in the root canal and to exhibit greater persistence than other species. E. faecalis was observed in a remarkable proportion of teeth exhibiting persistent periapical lesions, despite well-performed endodontic treatments, as well as in treatments with inappropriate obturation of the root canal. Similar to other facultative anaerobic microorganisms, E. faecalis can exhibit resistance to antimicrobial agents, endodontic procedures and intracanal medication.

The antimicrobial property of sodium hypochlorite solutions is proportional to its concentration. E. faecalis are resistant to NaOCl in low concentrations. The ideal concentration of sodium hypochlorite to achieve antimicrobial activity against E. faecalis was 5.25 percent when the time needed for microbial elimination was considered.

In this study, the previous enlargement of the root canal was limited to the action of #15 and #20 K-type instruments, as in a previous study, aiming to maintain the experiment as close as possible to actual clinical conditions. Other studies, however, have performed full preparation of the root canal before the inoculation of microorganisms and have applied average inoculation and incubation times of 48 or 72 hours. The microbial load inoculated in most studies, including this one, corresponds to McFarland standard 1.
Different from other studies, in this study, inoculation and incubation were performed over 21 days at 48-hour intervals and with 24-hour reinoculation seeking to accomplish complete contamination of the RCS, which was confirmed by the average values in the samples collected before instrumentation (TABLE 1). Therefore, this study found an initial microbial load in the samples collected before the endodontic procedures, which was different from other similar studies.12,13,15,16,30

Photosensitizers derived from phenothiazines, tricyclic heteroaromatic compounds and blue dyes, such as toluidine blue O (TBO) and methylene blue (MB), have been widely used in endodontic research using PDT.13,15,16,19,30,31 MB has been used as a target for endodontic microbiotic microorganisms13,15,19,30 and compared to a novel photosensitizer (Rose Bengal functionalized chitosan nanoparticles).32 MB at a concentration of 0.005% was used in this study, because of its hydrophilic nature and low molecular weight.33 The reduced amount of MB was shown to be effective against the E. faecalis.34 The dye exhibits an absorption band resonant with the wavelength of the employed light source. The present study applied the same pre-irradiation times as similar studies.13,19,30 The study by Souza et al. did not find a significant effect on the reduction of E. faecalis with either MB or TBO.35

The optic fiber used in this study was 55 mm in length; its initial diameter was 1 mm and it decreased gradually to reach 0.3 mm at the opposite end. According to the manufacturer, the optic fiber output power was 10 mW. Because the equipment power was adjusted to 40 mW, there was a 30-mW power loss. Therefore, by applying a 180-second exposure time, energy density of 1.8 J was attained at the spot in keeping with the results obtained in the study by Silva Garcez et al.12 In addition, no difference was shown in the use of PDT in periods one, two and four minutes.36

Quantitative analysis of the positive control group made evident the importance of using an irrigant exhibiting antimicrobial action, such as NaOCl. Reduction of the microbial load was observed with 0.85% saline solution, which was probably due to the physical effects of irrigation. This finding is in agreement with Byström’s and Sundqvist’s observations.37 Nevertheless, bacterial growth was observed 72 hours after instrumentation, which indicates the presence and viability of the remaining microorganisms. In qualitative assessment, the presence of microorganisms was confirmed in all of the samples by means of medium turbidity. Microorganisms were not found in the negative control group upon assessing medium turbidity, which confirms the sterilization of the specimens accomplished by ethylene oxide.

The experimental group treated with 5.25% NaOCl exhibited a dramatic reduction of the microbial load after instrumentation. Quantitative analysis revealed that microorganisms were recovered from one single sample in terms of CFU count. When PDT was used as an adjuvant to chemomechanical preparation, the microbial load measured by CFU count decreased by 100 percent, thus suggesting the absence of cultivable microorganisms. These two experimental groups exhibited different results in the assessment of medium turbidity, although not statistically significant. In the group receiving 5.25% NaOCl only, three specimens remained contaminated after instrumentation, thereby attaining a 70 percent reduction. In the group treated with 5.25% NaOCl followed by PDT, microorganisms were found in two specimens after instrumentation, thereby attaining an 80 percent reduction. Microorganisms were not found in both groups when assessed 72 hours after instrumentation.

Although qualitative and quantitative analyses exhibited diverging results, this finding can be explained. E. faecalis might be present in numbers below the number detected by CFU counting when assessing the culture method. The relatively frequent occurrence of E. faecalis was investigated38 in primary infections when polymerase chain reaction was used as an identification method, and these researchers compared it to the conventional culture method; E. faecalis was found in 82 percent versus 4 percent of cases, respectively. Assessment by medium turbidity might reveal the presence of possibly viable E. faecalis after chemomechanical preparation and PDT, albeit in numbers that cannot be detected in solid medium (Agar BHI).

Under the investigated conditions, the light parameters, photosensitizer, power, energy and pre-irradiation time outlined in this study were able to promote additional reduction of the microbial load after chemomechanical preparation; the application time was shorter compared to other suggested protocols.13,15,16,30
Conclusion

This study confirmed that the procedures of instrumentation and irrigation using NaOCl were efficient in accomplishing microbial reduction of Enterococcus faecalis biofilm; however, they were not able to promote its full eradication from the RCS. Despite the use of PDT with the described light parameters promoting additional microbial reduction, the overall effect did not exhibit statistically significant reduction. Further studies are needed to establish the best protocol for PDT regarding light parameters, type and concentration of photosensitizer, pre-irradiation time and energy to maximize reduction or even achieve full elimination of microorganisms.

REFERENCES

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Imagine taking your car to the shop for a minor repair — say, to replace the spark plugs or patch a tire. Now, imagine picking your car up at the end of the day to discover that your engine has been completely rebuilt — and you’re responsible for the bill. This scenario would be unlikely to occur in the auto repair industry, but it happens all too often in the dental industry, leaving broken trust, unhappy patients and disputed bills in its wake.

In one case reported to The Dentists Insurance Company, a patient was diagnosed with needing a three-surface filling. Although the patient was not experiencing any pain, decay was visible on the radiograph. The dentist explained to the patient that there was a possibility a three-surface filling would not suffice and instead a crown may be needed, which would be a more involved procedure. The patient scheduled an appointment for the filling.

During treatment, the dentist discovered that the tooth required more support and a crown would be a better option. The dentist told the patient that the treatment would take a bit longer and proceeded with preparing the tooth for a crown and provisionalizing it. He advised the patient to return in a few weeks for the permanent crown. Upon scheduling his next appointment, the patient was presented with a bill that was three times the original estimate. Staff explained the reason for the price difference and although the patient was upset about the increased treatment cost, he reluctantly paid with a credit card. The patient failed the appointment to seat the permanent crown. Instead, he disputed the charge with his credit card company, which initiated a chargeback to the dentist’s merchant account. The credit card company asked for documentation to support the charges. The office could only provide documentation of the patient’s acceptance of the fee for the three-surface filling, as a new treatment plan was never presented or signed by the patient when the treatment changed.

Trina Cervantes, Risk Management analyst with TDIC, said the issue stemmed from the dentist’s failure to disclose the cost involved with the crown prior to preparing it. While he went over the cost of the filling and

**Thorough Treatment Plans Build Patient Trust**

TDIC Risk Management Staff

Far too often, dentists either fail to provide a thorough treatment plan or fail to update the plan once the recommended treatment changes.

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mentioned the possibility the tooth may need a crown, he did not inform the patient that should he need a crown, it would be significantly more expensive.

“The patient felt ambushed,” Cervantes said. “Had he known earlier, he could have saved up the money, waited until he was in a better financial situation or set up a payment plan. Rather, he felt he was taken advantage of and questioned the need for the crown at all since it was not causing him pain.”

Unfortunately, this is a common scenario. Far too often, dentists either fail to provide a thorough treatment plan or fail to update the plan once the recommended treatment changes. The reasons for this are varied. Some dentists are so focused on clinical care that they do not consider the financial impact for the patient. Others assume that patients are as versed in the cost of dental treatment as they are; to a dentist, it makes sense that a crown would cost more, but the difference is not so obvious to a layperson.

“What is clear to a dentist is not necessarily clear to a patient,” Cervantes said. “If it is not outlined in a treatment plan, patients may not understand what their financial obligations are.”

Cervantes says communication is key to avoiding misunderstanding. Providing detailed treatment plans outlining all options and the costs associated with them can help mitigate any potential risk. Dentists can easily get caught up in the moment when the patient is in the chair. But even when the treatment plan changes course midtreatment, a revised treatment plan should be printed and signed by the patient before proceeding.

“Clear communication is critical to transparent practices, especially when money is involved,” Cervantes said. “It is important that dentists and staff get in the habit of confirming that the treatment plan is reviewed and accepted by the patient prior to performing the work.”

TDIC recommends keeping a signed copy of the treatment plan on file. In fact, Cervantes says having a signed treatment plan and consent form is the first line of defense should a lawsuit arise.

“It is up to the dentist to outline the risks associated with not following through with proposed treatment,” she said. “You can’t make the patient get the work done, but you can show evidence of reviewing these risks and trying to get the patient back in the office to complete treatment.”

Another consequence of poor doctor-patient communication is a breakdown of trust. Patients can begin to question whether the treatment was needed or whether the dentist was simply trying to make a quick and easy buck. In some cases, unhappy patients have filed complaints with the dental board, placing a practice under unwanted scrutiny and causing avoidable headaches. In other cases, patients turn to social media to voice their dissatisfaction through negative comments.

Providing patients with detailed treatment plans with cost breakdowns is essential for any practice owner. Communication and transparency allow patients to make informed decisions about their oral health, meet patient expectations and minimize patient complaints.

TDIC’s Risk Management Advice Line at 800.733.0633 is staffed with trained analysts who can answer treatment planning and other questions related to a dental practice.
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?

Lee Skarin & Associates have been successfully assisting Sellers and Buyers of Dental Practices for nearly 30 years in providing the answers to these and other questions that have been of concern to Dentists.

Call at anytime for a no obligation response to any or all of your questions
Visit our website for current listings: www.LeeSkarinandAssociates.com
An updated Guide to Dental Practice Act Compliance is now available on cda.org/practicesupport. Following are excerpts from the guide.

**Licenses, Academic Degrees and Name Tags**

Every dental licensee must communicate to a patient his or her name, license type and highest level of academic degree by one or both of the following methods:

- In writing at the patient’s initial office visit.
- In a prominent display in an area visible to patients in his or her place of practice.

If method one is chosen, the required information must be presented in 24-point type in the following format:

- **Health Care Practitioner Information**
  - Name and license type.
  - Highest level of academic degree.
  - Board certification, where applicable.

This same information must also be prominently displayed on a website that is directly controlled or administered by the licensee or his or her staff.

This law does not apply to a person working in a facility licensed under Section 1250 of the Health and Safety Code, which includes hospitals and skilled nursing facilities (B&P 680.5).

The names of every person employed in the practice of dentistry must be posted in a conspicuous place in the facility (B&P 1700 (c)).

Comply with the requirement to notify patients of clinical staff names, licenses and academic degrees by following these three actions:

- Clinical staff wear name tags or have licenses or certificates posted.
- Prominently post the name, license type and highest level of academic degree of each licensed individual or provide the information in writing in 24-point type to the patient at the initial visit.
- Prominently display the name, license type and highest level of academic degree of each licensed individual on the practice website.

**Advertising Discounts**

The advertisement of a discount must:

- List the dollar amount of the nondiscounted fee for the service.
- List either the dollar amount of the discount fee or the percentage of the discount for the specific service.
- Inform the public of the length of time the discount will be honored.
- List verifiable fees.

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Identify specific groups who qualify for the discount or any other terms, conditions or restrictions for qualifying for the discount. (CCR 16 Section 1051)

Corporation Name
Business and Profession Code Section 1804 states that: “Notwithstanding subdivision (i) of Section 1680 and subdivision (g) of Section 1701, the name of a dental corporation and any name or names under which it may be rendering professional services shall contain and be restricted (emphasis added) to the name or the last name of one or more of the present, prospective or former shareholders and shall include the words ‘dental corporation’ or wording or abbreviations denoting corporate existence, unless otherwise authorized by a valid permit issued pursuant to Section 1701.5.”

Dental Materials Fact Sheet
A dentist is required to provide a Dental Board-approved dental materials fact sheet to new patients and at least once to a patient before performing a restorative procedure. The dentist should obtain patient’s acknowledgement of receipt of the fact sheet and place the acknowledgement in the patient record.

The current fact sheet is dated 2004. The fact sheet may not be altered but dentists may provide patients with supplemental information (B&P 1648.10-1648.20).

Electronic Records
The safety and integrity of all patient records, including both hard copies and electronic files, must be ensured. If electronic record-keeping systems only are utilized in the dental office, the office must use an offsite backup storage system, an image mechanism that is able to copy signature documents and a mechanism to ensure that record is unalterable once it is input. The electronic health record system also must automatically record and preserve any change or deletion of electronically stored health information and requires the record to include, among other things, the identity of the person who accessed and changed the information and the change that was made to the information. The dentist must develop and implement policies and procedures to include safeguards for confidentiality and unauthorized access to electronically stored records, authentication by electronic signature keys and systems maintenance. Original hard copies of patient records may be destroyed once the record has been electronically stored. The printout of the computerized version shall be considered the original (H&S 123149 and Civil Code 56.101).

Place of Practice
A licensed dentist is required to register his or her place or places of practice or if he or she has no place of practice. Such registration must be done within 30 days of obtaining his or her license (B&P 1650 and 1655). A dentist must register any new place of practice within 30 days (B&P 1651).

Prior to opening an additional place of practice, a licensee or dental corporation must apply and receive permission from the Dental Board for the additional place of practice. This additional office permit requirement applies to a licensee who has proprietary interest or right to management or control in the practice. This requirement does not apply to licensees who practice dentistry outside of his or her registered place of practice in specified settings, such as licensed health facilities, schools and the homes of nonambulatory patients (B&P 1658, CCR 16 Sections 1045 and 1057).

A licensee who transfers an additional office to another licensee must notify the Dental Board within 30 days of the transfer (CCR 16 Section 1048).

A dentist maintaining more than one office in this state must assume legal responsibility and liability for the dental services rendered in each office and ensure each office complies with supervisory requirements and posts in an area likely to be seen by all patients a sign with the dentist’s name, mailing address, telephone number and dental license number (B&P 1658.1). ■

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.
6118 SAN FRANCISCO’S EAST BAY Unique opportunity. Large equity stake and 4-day work week being offered in an extremely well positioned and branded practice. 2016 produced $2.64 Million and collected $2.53 Million, reflecting a 10% improvement over 2015. Full complement of specialties offered. 300+ new patients in 2016. Delta Premier status shall continue.

6117 PATTERSON AREA 2016 collected $657,000 with $365,000 in Profits. PPO practice. Full Price $275,000.

6115 SAN FRANCISCO’S RUSSIAN HILL – CHINESE PRACTICE 2016 shall collect $300,000 with Profits of $145,000. Has been a $400,000 year performer. Full Price $90,000.

6114 AUBURN – ROSEVILLE AREA 2016 realized another $1.1+ Million year. Profits topped $425,000+. Beautiful and extensive facility leases for $1,60 sq.ft. Not a Premier Practice.

6113 FRESNO Consistently collecting $600,000+ per year. Shopping center location with fixed rent. Profits topped $370,000 in 2016. Full Price $335,000.

6112 HEALDSBURG Ideal as part-time practice in desirable locale or foundation to grow. 100% out-of-network. 2016 collected $2.53 Million, reflecting a 10% improvement over 2015. Full Price $1.5 Million.

6111 SANTA ROSA Perfectly positioned for next Owner. Best equipment, networked and digital including Pano. 3-days of Hygiene. 2016 trending $520,000+ with profits exceeding $250,000. Conservative Owner. Great location.

6110 CONCORD Well cared for practice. 2016 collected $260,000. 3-ops. 80 patients. Great curb appeal. Little done in marketing. Great merger opportunity for nearby practice. Full Price $135,000.

6107 EUREKA 100% out-of-network with insurance industry. 2016 produced and collected $1 Million on Doctor’s 20-hour week. Doctor’s schedule booked 3-months out. 7+ days of Hygiene. Highly respected. Full Price $250,000.

6106 SACRAMENTO’S EL DORADO HILLS 2015 collected $640,000. UCR Fees. Beautiful office. Very solid opportunity.

6105 MODESTO Collected $254,000+ on 3-day week. 3-days of Hygiene. 5-ops. Central location. Successor should open 4th day.

6103 SAN FRANCISCO’S UNION SQUARE Opportunity to acquire highly regarded practice right next to condo. Beautiful 5-ops, digital and paperless. 6th op available. 2015 collected $658,000.

6098 WEST PETALUMA The business center of the North Bay! Business parks are growing and young families are drawn to this great family community per the unique amenities of this historic river city. Collected $468,000 with Profits of $212,300. 4-days of Hygiene. 100% out-of-network with insurance industry. 2016 collected $260,000.

6089 MOUNT SHASTA Small town living renowned for outdoor lifestyle. 3-day week collected $950,000. Very strong bottom line. Digital including Pano. Full Price $350,000.

ANTELOPE VALLEY Has grossed $1.8 Million. Fantastic location. 60,000 autos pass by per day. 8 ops. Partnership for $250,000 or buy all. ARCADIA Facility only. 3-ops equipped. $65,000 or $95,000 with Ortho.

BAKERSFIELD AREA 5-ops, next to McDonalds. 1,800 sq.ft. includes building. Grosses $40,000/month. Full Price with building $350,000.

BAKERSFIELD Established 55 years. 5-ops in 3,000 sq. ft. Will do $1 Million. Full Price $300,000. Building available for $350,000.

BELLEFLOWER Established 60-years. Grossing $350,000. Full Price $240,000.

EAST LOS ANGELES One million Latinos in service area. PPS sold to Seller in 1985. Will do $1 Million in 18 months. Full Price $300,000.

EAST SAN FERNANDO VALLEY Absentee Owner. 8,000/month Cap Check. 4-ops. Do a Million within a year.

INDIAN 4,000 sq.ft. dental building. Full Price $650,000.

LADERA RANCH Grossing $650,000. Shopping center location.

LAGUNA NIGUEL Location, location, location! 4-ops with Panorex. Full Price $185,000.

LA JOLLA Established 20-years. 3-ops. Grossed $150,000. Super opportunity with immediate growth. Full Price $150,000.

LAWNDALE Hi identity. 2 ops. Full price $125,000.

LOS ANGELES HMO Grossing $1.2 Million. 5-ops. Full Price $1.2 Million.

LOS ANGELES HMO Does $4 Million.

NORCO – CORONA Will do $1.5 Million. 8-ops. Exquisite. Full Price $1.2 Million.

NORWALK Fantastic high identity location. 5 ops. Full Price $250,000.

ORAL SURGERY PRACTICE – LOS ANGELES Established 40 years.

ORANGE Beautiful 10 operatory office ready for merger.

PASADENA Established 60 years. 7-ops. Always $1+ Million. Full Price $600,000.

REDLANDS Shopping center. Grosses $350,000. Full Price $250,000.

RIVERSIDE Facility only. 4 ops. Full Price $50,000.

SOUTH ORANGE COUNTY BEACH CITY Grosses $650,000. 4 ops. Beautiful!

PERIO PRACTICE - PRESTIGIOUS BEACH CITY Established 40 years.

TORRANCE Established 12 years. 5 star building. 3-ops. Grossing $250,000. Full Price $195,000.

TUSTIN Dental building. Full Price $1.5 Million.


YUCCA VALLEY 8/10th of an acre. Great highway visibility. Full Price $250,000.
BAY AREA

AC-566 SAN FRANCISCO: Spectacular views of Washington Square. 3ops +2 add’l, 1400 sf $225k
AC-578 SAN FRANCISCO: Patient Charts: near Union Sq., 7 Doctor pts/day and 8 Hygiene pts/day $190k
AC-624 SAN FRANCISCO: Wonderful Patients, solid income in great stand-alone bldg. $475k
AC-640 SAN FRANCISCO: On 23rd Floor of Prestigious SF Bldg. 2ops in 700sf. Seasoned Staff, Seller Retiring $175k
AC-649 SAN FRANCISCO: Facility Only: Richmond District, 3 ops+1 add’l, Equipment less than 5yrs old $155k
AG-564 SAN FRANCISCO: 25 + yrs goodwill. Large 3600 sf w/ 9 ops near Land’s End $2.225M
AG-645 SAN FRANCISCO: Low Overhead, compact practice ready for expansion or relocation. Retail/Commercial area. 2nd Floor $125k
AG-648 SAN FRANCISCO: Newly built Dental Space now Available for Rent! Call for Details!
AN-514 SAN FRANCISCO: Facility: Located in the bustling financial district! 1007 sf w/4 ops Only $75k
AN-565 SAN FRANCISCO: Remarkable opportunity 2067 sf w/ 6 ops $1.05M
AN-592 SAN FRANCISCO: Easy accessibility, visibility & free parking! 1000sf w/ 2 ops + 1 add’l $100k
AN-513 REDWOOD CITY: The practice of your dreams! 900 sf w/ 4 ops + 2 add’l $375k
AN-642 SAN BRUNO: Don’t miss this one! FFS, 5 ops 1950 sf $740k (Real Estate $1.2M)
BC-432 PITTSBURG: Family-oriented Practice! 1640 sf w/ 6 ops. Seller retiring. $350k
BC-520 HAYWARD Facility: Located in Downtown, 1500 sf, 4 equipped ops, X-Rays in 3 ops. $65k
BC-646 ORINDA: Well-established, family-oriented Practice, Word-of-Mouth Refs, 4ops in 1080sf. $825k
BN-504 RICHMOND: Established Practice & Real Estate! 1450 sf w/ 2 ops + 2 add’l $100k /RE $700k
CC-567 ST. HELENA: Live & Practice in beautiful Wine Country, 5 ops 1842 sf single-story bldg $790k
CC-599 SANTA ROSA: Stable pts base, Well-respected Practice, 3 ops in 1040 sf $250k
CC-611 S. MARIN CO: Desirable, well-established neighborhood, 20npts/mo 3ops, 1100 sf $650k

BAY AREA CONTINUED

CC-632 SAN RAFAEL: Small town life, vibrant-growing city, 6-8 pts/day, 3ops in 800sf office in beautiful bldg $165k
CC-661 SAN RAFAEL: Starter Practice in beautiful location w/ like-new Equipment hardly used, 3 ops, 900sf $250k
CG-616 NAPA: State of the Art Practice - Seller moving out of state! Call for Details!
DC-480 SILICON VALLEY: Multi-Specialty Practice, 14+ops in 7500 sf, Owner Financing avail-Terms $1.075M
DC-604 LIVERMORE Facility: Turn Key Facility, fast growing city, 3ops +3 add’l plumbed in 2380 sf modern office $110k
DC-623 MENLO PARK: LOTS of room for GROWTH w/ close proximity to Facebook, Stanford, Google & Telsa $380k
DN-497 PLEASANTON Facility: Great Location! 870 sf w/ 3 ops + 1 add’l! Owner Financing 10% Down! $95k
DN-631 CAMPBELL: Rare Opportunity! 1100 sf w/3 ops, busy retail shopping center $249k
DG-519 SANTA CLARA Facility: Move In Ready! 2240 sf w 6 fully equipped ops $225k
DG-530 SAN JOSE: Dentrix JUST Installed! Highly respected practice! 2015 collections $1M+ $795k
DG-635 CASTRO VALLEY: Excellent Location & Stellar Reputation! Solo Group Practice $690k
DG-643 SAN JOSE: Sellerv Motivated! 3,300 sf w/ 4 ops + 2 add’l available! Call for Details! Only $65k
DG-581 SAN JOSE: Must See to Appreciate! Gorgeous Practice, stable patient base & loyal staff $496k
DG-619 SAN JOSE: One of the most unique practices you will ever see! 1450 sf w/ 5 ops $1.1M
DG-620 SAN JOSE: Location, Stable Educated Patient Base, Spacious 2100 sf 3 op office! $290k
DG-657 SARATOGA: Once in a Lifetime Opportunity! 1750sf 6 ops. Steadily increasing annual collections! $1.05M
DN-647 SANTA CRUZ: Family-Oriented with low overhead! 850 sf w/3 ops $210k

NORTHERN CALIFORNIA

EC-525 SACRAMENTO: Great Location! Excellent Visibility! 1500 sf w/ 3ops, 10-15 new pts/mo. Motivated Seller $195k

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NORTHERN CALIFORNIA

FC-531 GREATER SACRAMENTO: Practice & Real Estate 1750 sf/4ops + 1 add'l, 8npts/mo $800k
EN-464 ROCKLIN Facility: Don't miss out on this remarkable opportunity! 2150 sf/4 ops $100k
EG-638 CITRUS HEIGHTS: Focus on Crown & Bridge. 1,680 sf/2 ops. Plumbed for 1 add'l & Room to expand. (Real Estate also Available) CALL for DETAILS!
EG-639 CITRUS HEIGHTS: Real Estate for Sale – Call for Details!
EN-625 SACRAMENTO: Looking for a HMO practice in a great Location? 2,500 sf/5 ops $450k
EN-626 CARMICHAEL: Lifestyle you just can't be beat! HMO 1,250 sf/3 ops $350k
EN-628 ORANGEVALE: Great place to work, play & live. HMO 1,310 sf/4 ops + 1 add'l $325k
EN-627 CARMICHAEL: Remarkable HMO opp. awaits your talent & skill! 1,200 sf/3 ops $375k
EN-634 ROSEVILLE: Beautifully designed, well-appointed and fully digital! 2352 sf/4 ops + 2 add'l $235k
EN-660 ROSEVILLE: Highly-respected, well-respected, fee-for-service practice w/ loyal patient base. 2,950 sf/5 ops $995k
EN-654 CITRUS HEIGHTS: Well-Established, & loaded with 30+ years of goodwill! 1300 sf, 3 ops + 1 add'l $150k
EN-651 SACRAMENTO: Well-known for delivery excellent & compassionate care. 1750 sf, 4 ops $150k
FC-489 CLEARLAKE: Great lifestyle. 2015 Gross $915k on 3 day week, 4ops. Real Estate 3600 sf shared, interest “Pride Institute” designed office $470k
FN-527 TRINITY COUNTY: Be the only dentist in town! “Pride Institute” designed! 2350sf/5 ops + 1 add'l! $250k
GC-472 ORLAND: Live & Practice in charming small town community. 1000 sf w/ 2ops, Seller Retiring. $160k
GG-453 CHICO: 5000 sf/7 ops Perfect for 1 or more dentists! $325k
GG-454 PARADISE: 2550 sf/9 ops, 40 yrs goodwill! Amazing Opportunity! $525k
GG-617 YUBA CITY: Rare Opportunity to purchase Dental Facility with REAL ESTATE! $275k
GN-244 OROVILLE: Must See! Gorgeous, Spacious 2500 sf/5 ops! $315k
GN-399 REDDING: Loyal patient base & relaxed workweek schedule, 1440 sf/3 ops $150k
GN-546 CHICO AREA: Catering to fearful patients, offering quality sedation dentistry, 2600 sf/ 4 ops $350k
GN-606 BUTTE COUNTY: Hesitate & you'll miss out on this one-of-a-kind opportunity! 1700 sf/4 ops Reduced $125k
GN-641 YUBA CITY: Fantastic signage & visibility. Building available for purchase! 2,400 sf/5 ops $475k
GN-656 NO. TEHAMA CO: Great Location! Ideal place to work, live and raise a family! 2,468 sf/5 ops $275k

NORTHERN CALIFORNIA CONTINUED

HN-213 ALTRUAS: Well managed, consistent revenues! Collected ~$760 in 2016! 2020 sf/ 3 ops + 1 add'l. $195k
HN-280 NO FAST CA: Only Practice in Town 900 sf/ 2 ops REDUCED! ONLY $60k
HN-618 SIERRA FOOTHILLS: Seller Retiring! Much room for growth by increasing office hours! 750 sf/ 2 ops $95k
HN-633 AUBURN VICINITY: Loaded w/ warmth, charm & goodwill galore! 1,430 sf/4 ops $525k

CENTRAL VALLEY

IC-468 SAN JOAQUIN VALLEY: High-End Restore Practice! 6 ops in 2500+ sf office. Call for Details! $425k
IN-569 MADERA: Stellar reputation and load with goodwill! 2,900 sf/7 ops $634k
JC-541 FRESNO Facility: 1210 sf & consists of 2 fully equipped ops & plumbed for add'l op Call for Details!
IN-551 COALINGA AREA: Serving community of working families! Paperless Practice. 1200 sf/3 ops $395k

SPECIALTY PRACTICES

BC-600 CONCORD Ortho/Pedo Charts Only: Continue treatment to these Ortho/Pedo patients Call for Details! $400k
BC-612 CONTRA COSTA COUNTY Ortho: Just of the I-80 commuter corridor! Call for Details! Only $40k
CG-424 NAPA Prosth: Digital X-ray & NEW 3D Imaging Unit! On track to collect just under $1m $690k
EG-637 CITRUS HEIGHTS (Prosth): 1,680 sf/ 2 ops. Plumbed for 1 add'l & Room to expand. $390k (Real Estate Also Available)
FN-536 LAKE COUNTY: Focusing on Prevent dental problems before they begin! 1750 sf w/ 3ops $225k
HG-644 NORTH AUBURN (Ortho): 1750 sf w 5 chairs in open bay! Call for Details!
JC-543 CENTRAL VALLEY Ortho: 1650 sf w/ 5 chair bays & plumbed for 2 add'l, Strong Refs & Satisfied Pts Base $125k
JC-540 FRESNO Sleep Apnea: Motivated Seller retiring! Step right in & make it yours! Call for Details!

“Ask the Broker” can now be found at www.westernpracticesales.com
Tech Trends

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

CDC DentalCheck (Centers for Disease Control and Prevention, Free)

Dental health care facilities must perform routine audits of infection prevention compliance and keep detailed records of these reviews on site. This responsibility typically is assigned to a qualified team member who coordinates policies, procedures, education and training for continuous improvement to maintain compliance with Centers for Disease Control and Prevention (CDC) recommendations and ensure quality control. This task may be difficult to organize, as there are many elements to assess, both administratively and in the clinical practice setting. DentalCheck from the CDC is a tool that dental practices can use to automate this monitoring process and keep records to assure compliance with CDC recommendations as contained in the Guidelines for Infection Control in Dental Health Care Settings.

To begin a routine audit from the home screen, users simply start a new checklist, which contains a series of elemental questions categorized by Policies and Practices, followed by Direct Observation of Personnel and Patient-Care Practices. For each subcategory, users assess elements, or statements in the CDC recommendations in their dental health care facility, and answer “Yes, No or N/A.” An area to input notes or areas of improvement is provided for each element. Once users complete the entire checklist series of assessment questions, the audit is complete and recorded in the app. The entire history of assessments can be accessed from the home screen, where users can edit, preview, email or delete individual checklists. Additional resources from the CDC regarding infection control can be directly opened from the home screen.

Having a safe health care and working environment is vital to any dental care setting. Members of the dental team responsible for compliance in their own facilities need every tool at their fingertips to organize and keep track of these reviews. DentalCheck enables these team members to easily monitor and maintain records to ensure that their facilities are doing their best to maintain safety for patients and staff.

— Hubert Chan, DDS

Epson Home Cinema 3100 Projector (Epson, $1,299)

The Home Cinema 3100 Full HD 1080p 3LCD projector is a new addition to Epson’s line-up of projectors geared toward the home theater enthusiast. Boasting optimized brightness and contrast, this projector features 2,600 lumens of both color brightness and white brightness, as well as up to a 60,000:1 dynamic contrast ratio providing rich detail during dark scenes. What that translates to is an incredibly bright, crisp and detailed image, eliminating the need for blackout viewing conditions.

The 3LCD, 3-chip technology provides 3-D in full 1080p high definition and the projector is capable of projecting a 110” image from only 10.5’ away. The ability to position both the mounting of the projector as well as the projected image on the screen is made much easier given both vertical and horizontal lens shift, plus a 1.6x zoom lens. The 3100 provides dual HDMI inputs, with one offering MHL to allow for the direct-streaming of movies, games and more from MHL-enabled devices (such as a Roku Streaming Stick.) As for lamp life, Epson touts up to 3,500 hours in normal mode and up to 5,000 hours in ECO mode.

The unit itself is solidly built (weighing in at nearly 15 pounds), and the default image was impressive right out of the box. While calibration is always recommended, and it takes quite a bit of fine-tuning to dial in the projected image to just the right proportions (given the many adjustable settings that are included with this projector), the end result is an image that looks fantastic. However, the projector does not have a 12v screen trigger port (for the automatic triggering of the screen rolling up or down based on projector turning on or off), but that’s easily remedied by an add-on wireless unit for your screen.

— Blaine Wasylkiw, CDA director of online services

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

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The following Dr. Bob column was originally printed in the April 2006 issue of the Journal.

Call me prejudiced. Call me paranoid, biased and ignorant if you like, especially if you are larger than I am, but the fact of the matter is, I don’t like snakes. This reptilian anathema goes back to the early days of my Boy Scout career. Prior to my induction into the BSA, I considered snakes to be just overachieving worms, just as a rat was a buff mouse. But as every Boy Scout worthy of his Tenderfoot badge soon learns, snakes present such a life-threatening hazard that an entire section in the BSA Handbook is devoted to coping with anticipated encounters with them.

Our motto “Be Prepared” was not a hollow challenge. We had our tourniquet (neckerchief) and our Boy Scout knife (precursor of the Swiss Army knife) with its leather punch for punching leather and its main blade, so dull from playing mumbly peg and carving trees that it couldn’t slice margarine. Armed with this snakebite armamentarium, our instructions were clear: The moment one of the 42 million species of snakes bites you or a friend, apply the tourniquet between the bite and the victim’s heart. The handbook assumes the snake has had the decency to not go for a midsection or butt bite. Tighten until the extremity turns indigo, then grasping the Scout knife firmly, slice an “X” over each fang puncture until the area hemorrhages freely.

Sometimes a sock stuffed into the victim’s mouth helps reduce distractions. The rescuer, assuming there is one and the bitten person is experiencing syncope by this time, places his mouth over the puncture/slice wounds and sucks out the snake’s venom, being careful not to swallow it. It is then discreetly expectorated in a downwind fashion as
approved by the EPA. By this time, the snake, not being of a poisonous variety in the first place, has laughed itself to death and is no longer a threat.

I understand this technique is no longer in common use. Even 12-year-old boys not subject to the civilizing influences of society found this procedure disquieting, so it has been supplanted with a more modern treatment wherein the offending snake is counseled and given a severe reprimand. The victim may or may not be covered by his HMO at the discretion of his primary care provider.

Too late for me, however. My antipathy toward snakes is too deeply rooted to be influenced by herpetologists’ unconvincing explanations of their gentleness and general benefit to the ecology.

In my view, every snake is a flexible, protein-based tube of neurotoxins. Its one purpose in life is to propel itself straight for my jugular where the tourniquet/Scout knife technique is not applicable. The fact that I have not seen a snake for upward of 30 years is no excuse to relax my vigilance.

All of which explains why I was visibly shaken when my granddaughter announced that if we expected her to emerge from her high school biology class with anything more than a C–, it would be expedient to purchase a snake for her and a receptacle to contain it. What role the snake would play in the furtherance of her education was not clear, but its procurement was not to be denied.

My dislike for snakes is scientifically based on the following factors: No. 1: Locomotion. The verb “slither” had to be coined for snakes. Should it ever become necessary for you to inspect the underside of a snake, even though common sense dictates otherwise, you’ll notice it has no legs or feet. If it were human, it would be a quadriplegic and could park in restricted zones.

In spite of this handicap, a really fast snake on Full Red Alert has been clocked at 8 mph. I realize this doesn’t seem too impressive compared to the human he was chasing who was hitting 52 mph on the straightaways.

The slithering is accomplished by one of four methods: The Undulating Crawl or Serpentine, the Caterpillar or Rectilinear, the Sidewinder and the Concertina.

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There are actually reptile stores, upscale boutiques where exotic vertebrates are offered to reptilian aficionados at equally exotic prices. My granddaughter and I peered gingerly at a colorful variety of snakes, lizards, chameleons and turtles. The captive denizens stared back, transfixed as if fashioned of stone.

“Here’s a nice corn snake,” said the ponytailed, eyebrow-pierced youth serving us. The snake is about 18 inches long, banded orange and white. I conceded that it might be considered as attractive as a four-alarm fire silhouetted against an evening sky enthralling an arsonist. Another snake of the opposite gender might even offer a judgment of “Hubba, Hubba!” The snake and I maintained our distance and regarded each other with mutual loathing.

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All four methods of locomotion are unnatural, if not actually obscene, and I don’t want to talk about them anymore.

Reason No. 2 why snakes and I are not pals is that they are inarticulate.

Forever vivid in my memory is the vision of the unhinged jaw, the slow, peristaltic bulge moving tailward, the mouse’s tail still signaling fruitlessly as it disappears.

They do not bark, moo, meow, chirp or quack. Compared to a snake, a mime is a regular chatterbox. You can’t call, “Here, boy! C’mon let’s go for a slither.” No. They hiss. They stare at you with those slit eyes, flick that forked tongue and they hiss. I cannot be simpatico with anything that hisses and slithers. Or scuttles. A forthright animal worthy of trust does not scuttle.

Assuming that the snake, in order to survive even one semester of biology, must eat something, I questioned the Snake Man about the dietary requirements of our purchase. I figure a corn snake eats corn, right? Wrong. “Mice. He eats mice,” he said.

“Well, that’s unfortunate, we don’t have any mice. Let’s go,” I whispered to my granddaughter.

“No problem,” interrupted the Snake Man. “We have plenty of mice right here.” He indicated a cage where dozens of tiny mice, hairless, sightless and unsuspecting, stumbled around in sweet rodent innocence.

Out of respect for your sensibilities, I will spare you the gruesome details, but take my word, there is no sight more hurtful to the human psyche than witnessing a snake devouring a live mouse. Forever vivid in my memory is the vision of the unhinged jaw, the slow, peristaltic bulge moving tailward, the mouse’s tail still signaling fruitlessly as it disappears.

It’s the stuff of nightmares and the orgy repeats every week as long as the snake is our responsibility. We are petitioning the guidance counselor for a transfer to Early American Folk Dancing.

FREE TO GOOD HOME: Corn snake, like new. L0 miles; ideal pet; loves children and mice. Easily trained to slither and hiss on command. Complete with cage and subscription to “Rodent Raising for Fun and Profit.” Call anytime, day or night — will deliver; 555–1212.
Get your skills polished. Earn C.E. credits learning cutting-edge techniques in hands-on workshops. See your talent, tools, inspiration and community in a new light at CDA Presents.
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